

R E P O R T R E S U M E S

ED 002 906

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EFFECTS OF SPECIAL TRAINING ON THE ACHIEVEMENT AND ADJUSTMENT OF GIFTED CHILDREN, A SECOND REPORT.

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REPORT NUMBER CRP-614

PUB DATE

61

CONTRACT OEC-423

EDRS PRICE MF-\$0.16 HC-\$3.44 86P.

DESCRIPTORS- *GIFTED, INDIVIDUAL DEVELOPMENT, TRAINING, *SPECIAL EDUCATION, *CHILD DEVELOPMENT, ACADEMIC ACHIEVEMENT, ADJUSTMENT (TO ENVIRONMENT), *SUMMER PROGRAMS, *EXPERIMENTAL CURRICULUM, CURRICULUM RESEARCH, INTELLIGENCE, RURAL EDUCATION, CEDAR FALLS, IOWA

THE EFFECTS OF TRAINING GIVEN TO A GROUP OF GIFTED CHILDREN IN A SPECIAL SUMMER PROGRAM WERE TESTED DURING THE FOLLOWING SCHOOL YEAR WITH RESPECT TO OVERALL ACHIEVEMENT AND ADJUSTMENT AMONG THE STUDENTS. THE PROJECT WAS DESIGNED TO COMPARE THIS EXPERIMENTAL GROUP WITH TWO CONTROL GROUPS DRAWN FROM DIFFERENT SCHOOL POPULATIONS. IT WAS THE SECOND PHASE OF A LARGER CONTINUING STUDY, DEALING WITH GIFTED CHILDREN IN SMALL TOWN AND SPARSELY POPULATED AREAS. THE HYPOTHESIS TESTED WAS THAT THERE WOULD BE NO DIFFERENCES BETWEEN THE EXPERIMENTAL GROUP AND EITHER CONTROL GROUP IN THE OVERALL ANALYSIS OR AT ANY OF THE INTELLIGENCE-ACHIEVEMENT CLASSIFICATIONS USED IN THE STUDY ANALYSIS. APPROXIMATELY 170 GIFTED SIXTH GRADERS PARTICIPATED, 60 OF THESE BEING ASSIGNED TO THE SUMMER SESSION. SOME DEFINITE SUPERIORITIES WERE DEMONSTRATED BY THE EXPERIMENTAL GROUP, PARTICULARLY AT CERTAIN INTELLIGENCE-ACHIEVEMENT COMBINATIONS. IT WAS SUGGESTED THAT THIS FACT COULD IMPLY THAT SCHOOLS ARE NOT DOING DURING REGULAR TERMS ALL THAT COULD BE DONE TO HELP CHILDREN ACHIEVE THEIR POTENTIAL AND THAT THE SUMMER PROGRAM HAD SOME VALUES. HOWEVER, THE SUPERIORITIES OF THE EXPERIMENTAL GROUP WERE NEITHER FREQUENT ENOUGH NOR GREAT ENOUGH TO WARRANT AN UNQUALIFIED RECOMMENDATION FOR SPECIAL TRAINING. THIS IS A REPORT OF THE SECOND OF THREE PHASES OF A STUDY DONE ON OEC CONTRACT 423. (JH)

ED002906

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continuing study which began in the spring of 1958 under Contract

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the United States Office of Education will be reported in 1962.

It is impossible to acknowledge properly all who have contributed

to this endeavor. I do wish, however, to express my gratitude to the

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their gracious cooperation.

Nellie D. Hampton
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College for their assistance and efforts are truly given.

I am indebted especially to Dr. C. L. Bishop, Head, Department

of Education and Psychology, Iowa State Teachers College, for his adminis-

trative help and guidance to Dr. E. B. Merriam, Professor of Education,

College of Education, State University of Iowa, for his assistance with

the testing and the scoring of the Spss Tests of Basic Skills and to

Dr. Gordon Shaw, Professor of Education and Coordinator of Research,

Iowa State Teachers College, for his helpfulness throughout the investi-

The research reported herein was performed pursuant to a contract with the United States Office of Education, Department of Health, Education, and Welfare. Cooperative Research Project No. 614.

Special thanks are given by sincere appreciation to Dr. Gary

Larkin, Assistant Professor of Education and Psychology, Iowa State

Teachers College, for his support in all the negotiations involved

in this project and the assistance with the writing of Chapter 10.

1961

February, 1961

Nellie D. Hampton

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PREFACE

Contained herein is a report of the second phase of a larger continuing study which began in the spring of 1958 under Contract No. 423 with the United States Office of Education. The account of the first phase, which involved the follow-up of the participants in the 1958 summer session, was published in 1960. The third and final phase of the investigation now in progress under an additional contract with the United States Office of Education will be reported in 1962.

It is impossible to acknowledge properly all who have contributed to this endeavor. I do wish, however, to express my gratitude to the public school administrators, supervisors, and classroom teachers for their gracious cooperation and to my colleagues at Iowa State Teachers College for their assistance so willingly and freely given.

I am indebted especially to Dr. C. L. Bishop, Head, Department of Education and Psychology, Iowa State Teachers College, for his administrative help and guidance; to Dr. A. N. Hieronymus, Professor of Education, College of Education, State University of Iowa, for his assistance with the testing and the scoring of the Iowa Tests of Basic Skills; and to Dr. Gordon Rhum, Professor of Education and Coordinator of Research, Iowa State Teachers College, for his helpfulness throughout the investigation and particularly for the reading and criticism of this manuscript.

Finally, I wish to express my sincere appreciation to Dr. Harry LaPine, Assistant Professor of Education and Psychology, Iowa State Teachers College, who was responsible for all the computations included in this report and who assisted with the writing of Chapter IV.

February, 1961

Nellie D. Hampton

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CHAPTER I

THE PROBLEM AND THE HYPOTHESES

I. THE IMPORTANCE OF THE PROBLEM

Interest in providing more adequately for the intellectually gifted has grown tremendously in the last half-century. As others have suggested, perhaps this arousal of interest stems from two sources; namely, (1) the needs of the times for more trained personnel, and (2) an increased awareness of responsibility to this segment of our school population. For many years we have accepted an educational responsibility for the handicapped, but there has existed a somewhat vague feeling that special provision for the gifted was undemocratic. Though the concepts of self-realization and the unique value of the individual have been verbally expressed tenets of our society, there is some doubt that they have been operating values in the actual treatment of the gifted children in our school systems.

In our efforts to provide universal education we have wrongly interpreted "equal opportunity" to mean identical opportunity in equal amounts for all. The goal of education in terms of the development of competent citizens is the same for all alike, but the ideal of equal opportunity implies a recognition of and provision for individual differences in abilities and needs. Passow in his article, "Are We Shortchanging the Gifted?", pointed out that democracy does not mean the same as conformity and that special provisions are not

undemocratic (40).^{*} MacLean made the same point in his discussion of segregation of the gifted (33). The gifted need and are entitled to have the opportunity for the full development of their special abilities just as do those of lesser potential. Too often the outnumbered gifted have been lost in the shuffle of providing for the more numerous average and the frustrations of providing for the below average. DeHaan and Havighurst, writing in 1957, indicated that in their opinion and under present conditions less than half of the gifted children in our schools will

realize their potentialities and become distinguished persons, contributing in an outstanding way to the welfare of their society and gaining for themselves the satisfaction of excellent performance (7:19).^{**}

Perhaps the situation which actually brought to our attention the degree to which we had been derelict in our responsibilities to our capable young people was the shortage of trained personnel to meet the needs of our postwar economic expansion and to enter into the space, missile, and armament competition for national security. Schools now are being faced with the implied accusations in titles such as these appearing in current popular and professional publications: "Are Gifted Children Being Adequately Provided For?" "Waste of Fine Minds," "Young Geniuses: Our Greatest Waste," "All-American Learning May Discourage the Gifted," "Lowest-Common Denominator Education," "America's

^{*}Numbers in parentheses are used to refer to sources listed in the bibliography.

^{**}The number preceding the colon indicates the reference cited and the number following the colon indicates the page number on which the quotation appears.

Forgotten Child, the Gifted." Sensational writers compare the numbers of scientists and engineers we are producing with the numbers being trained in Russia, for example, and proclaim Russia's accomplishments in identifying and educating able students in keeping with their levels of abilities.

The contention that much talent is being wasted and that a large proportion of our gifted are making only mediocre contributions to the society to which they belong is supported in part by the numerous available estimates of the low proportion of able people who obtain various levels of advanced college degrees.

Dael Wolfle in his report on America's Resources of Specialized Talent reported that "fewer than half of the upper 25 per cent of all high school graduates ever earn college degrees; only six out of ten of the top 5 per cent do" (50:269). Also, Dr. Conant in his opening remarks to the NEA Invitational Conference on the Academically Talented Secondary School Pupil stated that "some 15-20 per cent of a typical American comprehensive high school should be going to college" (35:16). Undoubtedly we do have a large potential of intellectual resources which we fail to utilize to the fullest because of lack of training.

The failure of many bright students to continue in school has been attributed in part to the lack of stimulation in the school program. All too often the top ten per cent is held back to the level of much of the other ninety per cent, frustrated, bored, and feared by both parents and teachers whom they outstrip in capabilities. Terman

indicated his opinion of the importance of stimulation in the school program when he stated that "no method or combination of methods for the gifted will succeed that does not awaken their intellectual ambition" (36:18). In discussing educational causes for talent waste, the committee preparing Education of the Gifted also expressed the same idea in this fashion:

Sometimes curriculum offerings are restricted in scope; sometimes the quality of instruction is poor; sometimes books and other equipment are insufficient or of poor quality; but probably the most frequent type of educational inadequacy is the failure to challenge the gifted students to achieve up to capacity (9:29).

Later in the same publication the statement was made that "some human talent is wasted because the schools fail to identify, to challenge, to hold, or to educate adequately some of their gifted students" (9:86)

Though now the Division of Manpower and Employment in the Department of Labor is concerned with "upgrading the labor force" and parents and communities are showing increased concern about adequate education for the gifted, Passow feels that as yet "few schools have adequately met the challenge" (41:4). Various surveys in which high proportions of administrators report no special provision for the gifted substantiate this statement (39).

An examination of the literature reveals also that the procedures presently being employed for the education of these intellectually gifted generally are confined to districts in heavily populated areas and many of the suggestions and methods frequently are impractical or impossible in small communities or rural areas. Since almost fifty per cent of the population of the United States, and thus roughly fifty per cent of the

children who would be classified as gifted or talented, is found in rural areas and in communities of fewer than 10,000 (47:1-5), it is extremely important that some educational method or technique be devised which can be administered successfully to provide more adequately for these children in such areas.

Havighurst, writing in Education for the Gifted, states that of special importance is the development of programs for gifted children in the small towns and the villages of the country which do not have the numbers of students or the variety of resources to allow a variegated special program for gifted youth. These small-to-medium-sized communities can do much more than they now do, given interest and imagination on the part of teachers and school administrators (36:10-11).

II. STATEMENT OF THE PROBLEM

The program at the Iowa State Teachers College was set up in an attempt to devise and test a procedure which would be administratively, financially, and educationally feasible to deal with the gifted children in the small towns and villages of which Havighurst was speaking. This investigation involved (1) an eight-weeks summer session for gifted children, (2) daily transport of gifted children to a central location, and (3) a curriculum adapted to the special abilities of this type of children and to the kinds of schools which they attend during the regular year. There is every indication that a similar procedure could be used in small communities and rural areas to take care of children there.

Of particular significance concerning the design of the study were these four points:

1. two control groups were identified with which to compare the experimental group;
2. the experimental group and the two control groups were originally composed of approximately sixty subjects each;
3. treatment groups were matched on both level of performance on an intelligence test and level of performance on an achievement test; and
4. the post-testing was delayed approximately one academic year following the close of the special session for the experimental group.

III. THE HYPOTHESES TO BE TESTED

The major purpose of this study was to investigate the effects on achievement and adjustment during the following year of the training which was given to a group of gifted children enrolled in a special summer program. The study was designed so that the experimental group enrolled in the summer session could be compared with two control groups drawn from different school populations. The hypotheses being tested were that there would be no differences between the experimental group and either of the control groups in the over-all or at any of the intelligence-achievement classifications in any of the following:

1. Gains in achievement during the following school year as measured by the Iowa Tests of Basic Skills (31, 32).
2. Gains in adjustment as measured by the SRA Junior Inventory (43).
3. Changes in interests as measured by the What I Like to Do inventory (46).
4. Personal-emotional security as measured by the Institute of Child Study Security Test (The Story of Jimmy) (16).
5. Scores on locally adapted tests of critical thinking, expression, and library research skills.
6. Reputation in their peer group as indicated by a locally prepared instrument.

CHAPTER II

RELATED RESEARCH

Interest in gifted children and in the proper educational program for them is not a new development in this country. It was in 1868 that Superintendent Harris of St. Louis, Missouri, introduced his program of flexible and frequent promotions for the academically able students in the St. Louis schools. Similar administrative practices soon were established in other schools, followed closely by variations including double promotions, skipping grades, special classes, special schools, credit by examination, and other such accelerative techniques of which many are still in practice today.

The various programs for providing for the intellectually gifted may be classified broadly into three types:

1. Acceleration--in which the gifted cover essentially the same standard curriculum as do other students but at a more rapid pace or in which the gifted skip certain grades in the school program.
2. Ability grouping--in which the gifted children are separated from other students in special schools, special classes, or special sections for at least a part of the time and methods and materials providing a broad, enriched program are planned for them.
3. Enrichment in the regular classroom--in which the gifted children follow the same general curriculum as their age-grade groups but their teachers provide extra experiences to give breadth and depth of understanding.

The desirability of and the effectiveness of these various approaches have been the subjects of much discussion and disagreement.

All three have a common objective of providing a better educational program for talented children and each has had its era of popularity and its advocates. However, no one of them has been demonstrated to be outstandingly more successful or more desirable than any other. Nor are they mutually exclusive in their use. The Educational Policies Commission points out that enrichment is a policy rather than a plan and can be carried out with acceleration or ability grouping (9:56). Likewise acceleration may occur in conjunction with such grouping.

From the inception of the flexible promotion plan in 1868 until early in the twentieth century, acceleration in its various forms was the characteristic technique used to provide for the exceptionally able student. However, there still existed a gap between the real achievement level of the talented student and his actual grade placement. Louis M. Terman, for many years the outstanding proponent of this procedure, pointed out in 1925 that although the typical gifted child was accelerated over 40% above his chronological age in actual knowledge of subject matter taught, he was accelerated only 14% in grade placement (45:306).

When Witty and Wilkins surveyed the research dealing with acceleration prior to 1933, they concluded that much of it to that date was "fragmentary, poorly conceived, inadequately controlled, and vaguely reported" (49:346).

Engle, Hobson, Justman, Miller, and Wilkins are a few who more recently have studied the academic progress of accelerated students

(11, 20, 24, 25, 34, 48). Students in their studies were compared in some cases with matched non-accelerates and in other cases with the members of their grade group. The progress of the accelerates was reported variously as satisfactory, better than the control group, and not significantly different from the control group. In no instance was the academic achievement of the accelerates lower than the achievement of the group with which they were being compared, but the superiority of acceleration remained equivocal.

Educators of the 1920's also began to feel that by acceleration the bright child was being cared for only in terms of his greater rapidity of learning and that his abilities for greater depth and breadth of understanding were being neglected. In addition they became concerned over the problem of adjustment which might grow out of the disharmony among the rates of physical, emotional, social, and intellectual development. If a gifted individual were accelerated equivalent with his mental age or his academic achievement then he would be out of place socially and emotionally and likely to feel insecure and inadequate. Though Terman had pointed out that in actual knowledge of subject matter taught the typical gifted child is accelerated over 40% (45:306), he also pointed out that his acceleration in physical development is not likely to exceed 10% and in social development it is not likely to be over 20-30% (4:173).

The social and physical handicaps concurrent with sufficient acceleration to care for the gifted child have been described by

Hollingworth in this fashion:

If the child be accelerated in grade status so that he is able to function intellectually with real interest, he will be misplaced in other important respects. A child of eight years graded with twelve-year-olds is out of his depth socially and physically, though able to do intellectual work as well as they can. These problems come out clearly when we consider that seats and desks planned for twelve-year-olds will not fit him; that he will always be the last one chosen in athletic contests; that no one will know how to treat him at class parties; that the teacher will be prone to complain of his manual work, such as handwriting; and that he will be emotionally immature in comparison with older classmates (21:5-6).

Professor Hollingworth became one of the principal advocates of ability grouping and the removal of gifted children from the "lock-step systems" of the usual public school. She was convinced that homogeneous grouping was the answer to the education of gifted children wherever the population of such children was large enough to make such grouping possible. She began her studies in 1922 in an attempt to show the advantages of such an administrative device. In experimenting with children 7 1/2 to 9 1/2 years old in Public School 165 in New York City she found no significant differences in accomplishment in subject matter between the gifted children in her segregated groups with the special program and the non-segregated group. The achievement of these children seemed to be superior wherever they were. She concluded that

the advantages to be hoped for from the homogeneous grouping of gifted children lie not so much in the expectation of greater achievement in the tool subjects of reading, arithmetic, and spelling as in an enrichment of scholastic experience with additional intellectual opportunities (17:261).

Others followed her in attempting to show the superiority of special schools, special classes, and special groupings which separated out the gifted with a specially made enriched curriculum for them, but

results were not consistent. Subjective standards sometimes rated control groups higher on traits involving social and emotional growth, and achievement scores frequently showed no significant differences between groups. Nelson and Carlson in 1945 found essentially the same thing that Hollingworth had earlier; i.e., that special class placement did not affect scores on achievement tests and that bright students achieved above grade placement in regular classes as well (38).

Since the 1930's enrichment in the classroom has gained increasing popularity. Surveys indicate the favor shown the procedure by both administrators and classroom teachers, though frequently the educators are unable to describe their programs very adequately or support their opinions with experimental evidence (6, 15, 19). Passow, in discussing the lack of evidence to support the practice, suggests that

perhaps difficulties in designing research in this area account for the shortage . . . Schools might fruitfully conduct action research in this area to get needed evaluative data to support the arguments advanced in favor of this wide practice (36:204).

Although the progress of groups of gifted students using the Winnetka plan under Washburne (37:247-61) and self-administering units of enrichment under Dransfield (8) was shown to be satisfactory in those situations, Carroll, writing in 1940, stated that

the principal objection to enrichment for gifted children in the heterogeneous class is that in most cases it fails to work. Teachers are human beings with all the failings of human beings. Consequently, most of them prefer teaching procedures which require the least amount of time. They find it much easier to treat the class as a unit rather than as a loosely organized group of sub-groups and individuals. Mass education is infinitely simpler than individual teaching (5:246-7).

The Educational Policies Commission ten years later pointed out that

successful operation of differentiated enrichment . . . is greatly facilitated by having small classes, ample and varied instructional materials, flexible curriculum and standards, and versatile teachers. Such a combination of favorable conditions is as rare as it is desirable. Lacking it, the ideal of enrichment in heterogeneous classes is hardly ever attained satisfactorily (9:59).

During the past ten years there has been a deluge of material describing numerous programs in operation which are combinations of or variations on the three major classifications. Some of these have been summer programs and others have been regular school-year programs. Though claims have appeared from time to time as to the advantages of these summer programs to supplement the regular program for the gifted students, there have been few attempts to present substantiating research evidence. The programs generally have been of the enrichment type previously discussed in which students were offered opportunities in foreign languages, music, art, research in a chosen area, and recently mathematics and science. Thus, by nature, they would be subject to the same difficulties which have hampered evaluative research of regular year enrichment programs.

One attempt at evaluating certain outcomes of a summer program oriented around academic enrichment was that reported by Burkland in 1959 (3). He carried on an investigation in California in which students from third through seventh grades participated in a six-week summer program. The children were followed during the succeeding school year and gains in achievement, attitudes, and health status were studied. The investigator found that some of the experimental groups made significantly more growth in reading and arithmetic than their controls; that there was no

difference between the groups in language, in manifest anxiety, or in health status; and that in attitudes the differences favored the controls.

The experimental summer program as set up at the Iowa State Teachers College might be described as a combination of special ability grouping and enrichment. The participants were all children with an I Q or 120 or above who were brought together in homogeneous groups for the summer term. A special curriculum was designed to help these children utilize their abilities more fully. The classes were small, the variety and supply of instructional materials was almost unlimited, and the teachers were thought to be extremely competent and versatile. At the end of the summer term the children returned to their usual heterogeneous classes in their regular schools.

The Iowa Tests of Basic Skills (34) which had been administered in their schools in January, 1939. The subjects in each group were randomly selected as follows:

Fifteen subjects were selected from among the pupils scoring 126 or above on the intelligence test and having a composite grade-equivalent of 7.0 or above on the Iowa Tests of Basic Skills.

Fifteen subjects were selected from among the pupils scoring 126 or above on the intelligence test and having an IQS composite of 5.9 or below.

Fifteen subjects were selected from among the pupils scoring between 120 and 125 on the intelligence test and having an IQS composite of 7.0 or above.

Fifteen subjects were selected from among the pupils scoring between 120 and 125 on the intelligence test and having an IQS composite of 5.9 or below.

A third group, identified as Group E, was selected from students in another school system in which there was an enrichment program for

CHAPTER III

THE PROCEDURE

I. THE SUBJECTS

The subjects chosen for the second phase of this experiment were children who had completed the fifth grade in the spring just previous to the experimental summer session and who had achieved an I. Q. of 120 or above on the Herrn-Nelson Tests of Mental Ability, Revised Edition, Form A for grades 3-6 (28). Two groups of sixty each were selected from a population of fifth graders and one was designated as Experimental Group D and the other as Control Group F. The two groups were matched with respect to levels of performance on the intelligence test and on the Iowa Tests of Basic Skills (32) which had been administered in their schools in January, 1959. The subjects in each group were randomly selected as follows:

Fifteen subjects were selected from among the pupils scoring 126 or above on the intelligence test and having a composite grade-equivalent of 7.0 or above on the Iowa Tests of Basic Skills.

Fifteen subjects were selected from among the pupils scoring 126 or above on the intelligence test and having an ITBS composite of 6.9 or below.

Fifteen subjects were selected from among the pupils scoring between 120 and 125 on the intelligence test and having an ITBS composite of 7.0 or above.

Fifteen subjects were selected from among the pupils scoring between 120 and 125 on the intelligence test and having an ITBS composite of 6.9 or below.

A third group, identified as Group E, was selected from students in another school system in which there was an enrichment program for

rapid learning children during the regular school year organized under a special resource consultant. These children also were selected on the basis of their scores on the Henmon-Nelson Tests of Mental Ability, Revised Edition, and classified into the four intelligence-achievement categories as were those in Groups D and F. The population from which Group E was selected, however, did not yield fifteen subjects in each category; 48 were selected in such a way as to yield the desired number wherever possible.

The characteristics of these three original groups according to intelligence, achievement, and age are given in Tables I, II, and III, on pages 16, 17, 18.

The sixty children comprising the Experimental Group D were transported daily to a single center for an eight-week summer session (1959) involving a specially planned curriculum. Five pupils from each of the four intelligence-achievement classifications were randomly assigned to each of three instructional groups. One teacher was then assigned to each group of twenty children.

II. DATA-GATHERING DEVICES AND PROCEDURES

The Henmon-Nelson Tests of Mental Ability, Revised Edition, Form A, for grades 3-6 (28), were used to identify the rapid learners eligible for inclusion in this study. The tests were administered to all fifth graders in the schools involved in November, 1958.

The Iowa Tests of Basic Skills, Form 2 (32), were used as the pre-test measures of achievement and were the second basis (in addition to intelligence) for classifying the children. These were administered in

TABLE I
INTELLIGENCE QUOTIENTS FOR GROUPS D, E, AND F ON THE
HENMON-NELSON TESTS OF MENTAL ABILITY,
REVISED EDITION

Intelligence Quotient	Frequency		
	Experimental Group D (N = 60)	Control Group E (N = 32) ^a	Control Group F (N = 60)
144 - 146	0	0	1
141 - 143	1	0	0
138 - 140	1	0	2
135 - 137	0	1	1
132 - 134	5	6	4
129 - 131	9	1	6
126 - 128	14	8	16
123 - 125	14	5	16
120 - 122	16	11	14
Mean ^b (ungrouped data) . .	125.98	125.75	126.15
Standard Deviation (ungrouped data)	4.68	4.68	5.15

^aFor the present purpose some cases were eliminated by random rejection in order to obtain equal numbers in each subclass, thereby obviating a source of bias in the mean and standard deviation.

^bDifferences between the means of Groups D versus E and D versus F fell between the .90 and .50 levels of confidence.

January, 1959. These same tests, Form 1 (31), were a part of the post-testing conducted in the spring of 1960. Since these tests are administered customarily in many Iowa schools in January and since it seemed inadvisable to test above grade level in arithmetic, the score for the arithmetic area at the January testing was used as the post-test measure. Other areas of the battery were readministered early in May and the eighth

TABLE II
PRE-TEST COMPOSITE GRADE-EQUIVALENTS FOR GROUPS D, E, AND F
ON THE IOWA TESTS OF BASIC SKILLS

Score	Frequency		
	Experimental Group D (N=60)	Control Group E (N=32) ^a	Control Group F (N=60)
8.0 - 8.4	4	1	4
7.5 - 7.9	9	4	7
7.0 - 7.4	17	11	19
6.5 - 6.9	16	8	14
6.0 - 6.4	5	2	10
5.5 - 5.9	5	4	5
5.0 - 5.4	4	1	1
4.5 - 4.9	0	1	0
Mean ^b (ungrouped data)	6.88	6.85	6.87
Standard Deviation (ungrouped data)	.76	.59	.88

^aFor the present purpose some cases were eliminated by random rejection in order to obtain equal numbers in each subclass, thereby obviating a source of bias in the mean and standard deviation.

^bDifferences between the means of Groups D versus E and D versus F fell between the .90 and .50 levels of confidence.

Differences between the means of Groups D versus E and D versus F fell between the .50 and .20 levels of confidence.

grade level was used to minimize any ceiling effects which might influence the scores of children of the capability of those in the experiment.

Other tests administered in January of 1959 as pre-tests and again in April of 1960 as post-tests were the following

1. The Institute of Child Study Security Test, Elementary Form (16)
2. The SRA Junior Inventory, a needs and problems inventory (43)
3. What I Like to Do, an inventory of children's interests (46)

TABLE III

CHRONOLOGICAL AGES FOR GROUPS D, E, AND F
IN NOVEMBER, 1958

Chronological Age	Frequency		
	Experimental Group D (N=60)	Control Group E (N=32)	Control Group F (N=60)
133 mos. - - 138 mos. . . .	3	0	2
127 mos. - - 132 mos. . . .	17	10	24
121 mos. - - 126 mos. . . .	35	16	31
115 mos. - - 120 mos. . . .	5	6	3
Mean ^b (ungrouped data) . . .	124.68 mos.	124.75 mos.	125.65 mos.
Standard Deviation (ungrouped data)	3.83 mos.	3.46 mos.	3.66 mos.

^aFor the present purpose some cases were eliminated by random rejection in order to obtain equal numbers in each subclass, thereby obviating a source of bias in the mean and standard deviation.

^bDifferences between the means of Groups D versus E and D versus F fell between the .50 and .20 levels of confidence.

Included in the post-testing in May were three locally adapted tests entitled "Test I: Library Research," "Test II: Critical Thinking," and "Test III: Expression."

Test I was designed to measure library research skills and contained thirty items covering the purposes of parts of a book, general knowledge of the types of sources to use to find particular kinds of

information, use of the library card, catalog, and knowledge of certain specific reference sources.

Test II, "Critical Thinking," was composed of two poetry and eight prose reading selections varying in length from one to five paragraphs. Each selection was followed by three to eight multiple-choice items which demanded very careful and informed analysis of the material. There were a total of sixty items in this test.

Test III was constructed to test correctness and appropriateness of expression and contained fifteen items. It was made up of a passage of three paragraphs written in "spread-out" form in which certain parts were underlined and numbered. Some of the underlined sections contained errors in capitalization, punctuation, and usage; some were examples of poor writing; and some were entirely correct. The student had to decide if a change were needed and, if so, which of the suggested ones was the proper revision.

Added to the post-testing for this phase of the experiment for Groups D and F was a sociometric-choice test of the "Who do you think?" type administered during the last week of February, 1960. Each child was asked to choose three of his classmates who were best described by each of fifteen statements of desirable social, emotional, and intellectual traits.

III. PROCEDURE FOR ANALYZING THE DATA

The general plan of this investigation was to study the differences between the experimental group and each of the two control groups,

over-all and at each intelligence-achievement category, in growth in achievement, in awareness of personal needs and problems, in feelings of security, in interests, and in classroom reputation among peers. In these comparisons of the experimental and each control group, the analysis of variance was applied to the change scores (differences between pre- and post-tests) or to test scores as the situation demanded. The design used was an $A \times L_1 \times L_2$ where A represented the experimental and control treatments and L_1 and L_2 stood for the dimensions of the selector variables, i.e., intelligence and achievement. The error term used was the within cells mean square. In accordance with the importance of subclass findings in the present study, differences between individual pairs of mean criterion scores were tested. The following was the formula employed for the estimate of error variance of the difference between two corresponding means, based on n_1 and n_2

$$\sigma^2(A_1 - A_2) = ms_{\text{error}} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)$$

Then, the ordinary t-test was used to test the significance of the difference between means, with the degrees of freedom found in ms_{error} (see 29: 243 f:).

Homogeneity of subclass variances was examined. For every analysis of variance the ratio of the largest of eight subclass (cell) variances to the smallest was computed and checked for its degree of significance (42:49-51, 179). For those variables on which the .05 level of significance was reached the assumption of homogeneity of variance was rejected and appropriate procedures and tests of significance were used in assessing the significance of findings in the

analysis of variance. If the F ratio of the larger variance to the smaller for a pair of subclasses was significant at the .05 level a correction was applied to the t-test of the difference between the means. When the treatment main effect was the matter under analysis, a modified t-test involving correction of each standard error of a mean was used in testing the difference between the over-all means of experimental and control groups. In specifying the .05 level of significance of the effect of either intelligence or achievement or in specifying the .05 level of significance of any interaction an F ratio as large as would ordinarily be needed for significance at the .025 level was required. The correction for testing the difference between subclass means was one devised by Cochran and Cox (see 10).

IV. THE CURRICULUM

The special eight-week session planned for the experimental group had as general objectives the improvement of certain attitudes, techniques, and knowledges which would help rapid learning children to utilize their abilities more fully. The more specific objectives were stated as follows:

1. To develop and improve the ability of each child to think independently and creatively.
2. To develop an appreciation for reasoning and proof.
3. To develop an understanding of the importance of objectivity and evidence.
4. To develop skill in logical reasoning.
5. To arouse and develop an increased awareness, an appreciation, and a respect for the role of the intellectual in the progress of mankind.

6. To develop skill in the use of library materials.
7. To improve the ability to do research--to select a problem, define it, and modify it; to survey, select, and obtain information from many sources; to analyze information, organize, synthesize, and evaluate it.
8. To cultivate in each child a sense of responsibility to himself and to the group.
9. To guide each child to a better understanding of himself, his peers, his family, and other associates.
10. To improve reading rate and comprehension.

The curriculum was designed largely around the subject matter interests of the children. These interests became one of the major vehicles for the accomplishment of the objectives of the program as each child was given the opportunity to do individual research on his particular chosen topic. Useful tools, techniques, and methodology of research were incorporated into each child's experiences as he developed his topic.

Each child was helped to limit his topic so he could survey the available literature, select the relevant information, and organize it into a research paper. Skills pertaining to using the library card catalog and other sources for locating information, preparing bibliographies, taking notes, outlining, and any additional skills necessary in the writing of research papers were taught as the children became ready for them and needed them. The topics chosen varied from terriers to pi and mu mesons, but each served as the motivating influence for the learning of the skills and methods of conducting and reporting library research.

Experiences in planning and evaluation were provided as an integral part of the program. Each group, with the aid of the teacher, planned each day. Each child, also with the aid of the teacher, made daily, weekly, and bi-weekly evaluations of his activities and progress.

The rigidity of thinking displayed by the children pointed up the necessity for planned periods of activities designed to give experience in ideational fluency and redefinition ability. Such periods were incorporated in the daily program.

The children also participated in a study of human relations in which they were guided into discussions and role-playing of such things as their own behavior, their peer relationships, and their family relationships.

A direct attack, in the form of timed reading followed by comprehension exercises, was made on the improvement of reading. Two or three periods per week were planned for such activities.

It seems inadvisable, in the interest of maintaining the control situation, to give any more specific information about the curriculum at this time. This report pertains to only one phase of a larger continuing study which has included another special summer program (1960) and will involve delayed post-testing of other experimental and control groups in the same schools involved in this portion of the study.

CHAPTER IV

FINDINGS

Each of the three treatment groups was given a series of tests as discussed in the preceding chapter. The subject of the present chapter is the analysis and interpretation of the outcomes of these tests.

Not all of the rapid learners from the original samples could be included in the analyses of variance. It was felt to be desirable to obtain about the same ratio of boys to girls in the subclass samples to be analyzed as had been found in the population of rapid learners from which the sample had been drawn. There was also the need for the subclasses to contain proportional numbers of cases from treatment to treatment and from level to level on each of the factors of intelligence and achievement. In order to meet these conditions the original sixty subjects in each of Treatment Groups D and F and the forty-eight in Group E were reduced from those numbers shown in Table XXV to those in Tables XXVI and XXVII of the Appendix. It may be noted from the tables mentioned that for some variables the categories, or subclasses as they will henceforth be called and which were differentiated on the basis of level of intelligence and of achievement, differed somewhat in the numbers of cases assigned to them. By taking into account the sizes of and the differences between the correlations of each selector with the criterion it was possible to retain varying numbers of cases in the subclasses and yet create almost no biasing influence upon

the main (over-all) effect of treatments in each analysis of variance that was to be made. In any case, the effect of disparate numbers in weighting any given subclass should not have been appreciable since differences between cell frequencies were small.

I. ACADEMIC SKILLS

The Iowa Tests of Basic Skills (31, 32) were the measures employed in this study for the assessment of gains in academic skills. The criterion measures were the change scores represented by the differences between 1959 pre-test and 1960 post-test grade-equivalents. In the variance analyses each change score was multiplied by ten and a constant of 30 was added to eliminate decimals and negative scores.

Three locally adapted tests, the tests of "Library Research," "Critical Thinking," and "Expression," were used to assess status in certain academic skills at post-test time. Since these tests had not been given as pre-tests, the criterion scores were the numbers of correct responses on the tests in May, 1960.

Group D versus Group E

Iowa Tests of Basic Skills. Findings from the ITBS (Iowa Tests of Basic Skills) which relate to the gains in achievement made by the reduced samples are presented in Tables IV, V A, and V B on pages 26, 27, and 28. These data reveal that Group D had an observed superiority over Group E in 38 out of 48 subclass comparisons and in all twelve comparisons of main effect. In both the areas of Reading Comprehension and Work-Study Skills there were Group D over-all superiorities which

TABLE IV

MEANS OF CHANGE SCORES FOR GROUPS D AND E
ON THE IOWA TESTS OF BASIC SKILLS

Area#	Interval Between Testings	Sex	Mean of Grade-Equivalent Gains											
			Low-Low			Low-High			High-Low			High-High		
			Group	Subclass	Group	Group	Subclass	Group	Group	Subclass	Group	Group	Subclass	Combined
			D	E	D	E	D	D	E	D	E	D	E	D
Vocabulary	16 mos.	Boys	2.12	1.60	3.18*	1.93	1.58	2.27	2.56	2.20	2.36	2.00		
		Girls	1.56	1.33	1.76	1.74	1.81	1.74	2.30	2.52	1.83	1.78		
		Boys and Girls	1.82	1.16	2.10	2.12	1.90	1.68	2.28	2.42	2.02	1.84		
Reading	16 mos.	Boys	2.42	1.93	2.56	2.33	2.20	2.73	2.90 ^a	1.17	2.52	2.04		
		Girls	2.13	1.74	2.56	2.12	1.83	2.07	2.80	2.50	2.27	2.08		
		Boys and Girls	2.00	2.02	2.72	2.04	2.88	2.50	3.18*	1.70	2.70 ^a	2.06		
Language Skills	16 mos.	Boys	1.30	.83	2.32	1.63	1.84	1.90	2.10	1.87	1.89	1.56		
		Girls	2.05	2.18	2.76	2.48	2.52*	1.73	2.64	2.48	2.47	2.20		
		Boys and Girls	1.74	1.60	2.88*	1.98	2.52*	1.58	1.76	2.06	2.22	1.80		
Work-Study Skills	16 mos.	Boys	1.82 ^a	.50	2.86 ^a	1.47	2.52 ^b	.07	2.52 ^a	1.00	2.43 ^b	.76		
		Girls	2.20*	1.53	2.42	2.24	2.83 ^b	1.17	2.82 ^a	1.52	2.56 ^b	1.59		
		Boys and Girls	1.68	1.08	2.88*	1.84	2.96 ^b	.88	2.30 ^a	.96	2.46 ^b	1.19		

^aGreater than the corresponding subclass mean at the .05 level of significance.

^bGreater than the corresponding subclass mean at the .01 level of significance.

^cArithmetic post-test not administered to Group E.

TABLE V A

ANALYSES OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND E
ON THE IOWA TESTS OF BASIC SKILLS

SSource of Variation	Sex df	Mean Square				F			
		V	R	L	W	V	R	L	W
Treatments	Boys 1 Girls 1	97.20 2.52	171.60 46.02	82.50 84.57	2095.86 1040.82	1.21 .03	2.18 .60	.91 1.40	30.03 ^b 14.93 ^b
Intelligence Levels . .	Boys 1 Girls 1	28.12 266.03	.78 22.56	94.53 .57	2.53 0	.35 3.03*	.01 .29	1.04 .01	.04 0
Achievement Levels . .	Boys 1 Girls 1	378.12 256.93	1.53 355.67	236.53 240.13	371.28 109.39	4.72 ^a 2.93*	.02 4.65 ^a	2.60 3.98*	5.32 ^a 1.57
Treatments x Intelligence Interaction . .	Boys 1 Girls 1	205.41 11.01	11.10 54.31	45.02 54.57	74.42 305.82	2.56 .13	.14 .71	.50 .90	1.07 4.39 ^a
Treatments x Achievement Interaction . .	Boys 1 Girls 1	147.41 18.23	188.75 26.00	12.36 3.00	34.66 49.65	1.84 .21	2.39 .34	.14 .05	.50 .71
Intelligence x Achievement Interaction . .	Boys 1 Girls 1	8.00 30.66	30.32 25.63	124.03 1.27	87.78 23.47	.10 .35	.38 .34	1.36 .02	1.26 .34
Treatments x Intelligence x Achievement Interaction	Boys 1 Girls 1	4.80 .51	299.25 17.28	.25 73.27	47.51 .98	.06 .01	3.79* .23	.00 1.21	.68 .01
Within Groups	Boys 24 Girls #	80.12 87.67	78.86 76.50	90.92 60.35	69.79 69.71				
Total of Sums of Squares	Boys . . . Girls . . .	V . . . V . . .	R - 2791.94, R - 4092.69,	L - 2595.68, L - 3607.47,	R - 2777.30, R - 2629.98,	L - 4389.00 L - 4039.69			

Key: V - Vocabulary, R - Reading Comprehension, L - Language Skills, W - Work-Study Skills.

^aSignificant at the .05 level of confidence. ^bSignificant at the .01 level of confidence.

#df for V and R is 40 and for L and W is 36.

TABLE V B

ANALYSES OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND E
ON THE IOWA TESTS OF BASIC SKILLS

Source of Variation	df	Mean Square				F			
		V	R	L	W	V	R	L	W
Treatments	1	32.40	396.90	176.40	1600.22	.38	6.43 ^a	2.30	20.12 ^b
Intelligence Levels	1	72.90	136.90	4.90	9.02	.86	2.22	.06	.11
Achievement Levels	1	348.10	3.60	96.10	119.02	4.10 ^a	.00	1.25	1.50
Treatments x Intelligence Interaction	1	19.60	90.00	10.00	198.02	.23	1.46	.13	2.49
Treatments x Achievement Interaction	1	67.60	202.50	14.40	5.62	.80	3.28*	.19	.07
Intelligence x Achievement Interaction	1	.90	96.10	202.50	403.22	.01	1.50	2.64	5.07 ^a
Treatments x Intelligence x Achievement Interaction	1	6.40	10.00	250.00	87.02	.08	.16	3.25*	1.00
Within Groups	32	84.98	61.70	76.84	79.52				
Total of Sums of Squares V - 3267.26, R - 2910.40, L - 3213.18, W - 4966.78									

Key: V - Vocabulary, R - Reading Comprehension, L - Language Skills, W - Work-Study Skills.

^a Significant at the .05 level of confidence.

^b Significant at the .01 level of confidence.

were significant. Additionally on these variables there were six significant and three highly significant subclass superiorities on the part of Group D. Further trends are indicated by the asterisks beside means in Table IV.* Reference to the direct products of the analyses of variance given in Tables V A and V B indicates that the effect of level of achievement was significant for boys, girls, and boys together with girls on some variables, with results in each instance favoring the high over the low level. Significant F ratios in Tables V A and V B reflect an inconsistency in the interaction of treatments and intelligence and of intelligence and achievement in the Work-Study Skills area. The significant achievement interaction for the two sexes combined in Work-Study Skills directs attention to the over-all superiorities of the Low-High and High-Low subclasses in both treatments and particularly to the superiorities of Group D in these subclasses. Possibly the children with high intelligence (as were all children in this investigation) but striving somewhat in terms of achievement are helped more by some extra attention whether in a special session or by a special supervisor in their regular school.

Locally Adapted Tests. Results of the tests of "Library Research," "Critical Thinking," and "Expression" for treatments D and E are reported in Tables VI and VII on pages 30 and 31. An examination of these tables reveals one statistically significant over-all difference between

*The asterisks denote comparisons in which the significance of the difference between corresponding means was between the .10 and the .05 levels of confidence and may indicate trends worthy of additional study. The writer realizes the considerations involved in the identification of such means and makes no claims for these differences other than that they may serve to indicate areas for further investigation.

TABLE VI

MEANS OF SCORES FOR GROUPS D AND E ON THE
LOCALLY ADAPTED SCHEMATIC TESTS

Test	Sex	Mean of Raw Scores									
		Low-Low Subclass		Low-High Subclass		High-Low Subclass		High-High Subclass		Combined Subclasses	
		Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E
Library Research	Boys	16.80*	13.00	20.60	18.33	17.20	15.67	19.60	18.33	18.50*	16.33
	Girls	15.57	14.57	20.20	19.80	18.29	16.86	19.60	18.20	18.17	17.08
	Boys and Girls .	16.00	14.20	22.80*	19.60	18.80*	16.20	19.60	18.00	19.25*	17.05
Critical Thinking	Boys	27.60	24.00	37.00	35.67	27.00	31.00	32.60	34.33	31.05	31.25
	Girls	23.71	27.00	30.80	35.20*	31.57*	26.43	37.60	36.80	30.38	30.58
	Boys and Girls .	27.60	23.60	34.60	34.60	32.20*	28.60	31.80	36.00	30.65	30.10
Expression	Boys	7.20	6.33	8.80	8.00	6.60	7.00	7.20	8.33	7.45	7.62
	Girls	6.43	6.86	8.20*	6.60	7.71	6.71	8.20	8.60	7.54	7.08
	Boys and Girls .	6.60	6.20	8.40*	6.60	7.60	6.60	8.00	8.60	7.65	6.90

*Greater than the corresponding mean at the .05 level of significance.

†Greater than the corresponding mean at the .01 level of significance.

TABLE VII

31

ANALYSIS OF VARIANCE OF SCORES FOR GROUPS D AND E
ON THE LOCALLY ADAPTED SCHOLASTIC TESTS

Source of Variation	Sex	df	Mean Square			F		
			Library Research	Critical Thinking	Expression	Library Research	Critical Thinking	Expression
Treatments . .	Boys	1	35.21	.30	.01	4.10 ^a	.01	.00
	Girls	1	14.08	.52	2.52	2.62	.02	.86
	Both	1	48.40	5.62	5.62	7.62 ^b	.13	1.91
Intelligence Levels . . .	Boys	1	.50	2.00	2.00	.06	.06	.56
	Girls	1	12.00	180.19	7.52	2.23	4.93 ^a	2.56
	Both	1	.10	90.62	4.72	.02	1.13	1.44
Achievement Levels . . .	Boys	1	91.12	450.00	12.50	10.62 ^b	9.34 ^b	3.37 ^a
	Girls	1	114.19	732.07	9.90	21.21 ^b	20.02 ^b	3.37 ^a
	Both	1	136.90	354.02	13.72	2.16	7.93 ^b	4.90 ^a
Treatments x Intelligence Interaction	Boys	1	5.63	53.33	4.80	.66	1.11	1.30
	Girls	1	1.33	150.52	.02	.25	4.12 ^a	.02
	Both	1	.50	.02	1.72	.06	.00	.12
Treatments x Achievement Interaction	Boys	1	1.88	.00	.30	.22	.00	.08
	Girls	1	.29	21.71	.50	.05	.59	.17
	Both	1	0	180.62	.02	0	4.05 ^a	.02
Intelligence x Achievement Interaction	Boys	1	8.00	60.50	1.25	.93	1.26	.36
	Both	1	62.50	18.22	.02	9.84 ^b	.41	.02
Treatments x Intelligence x Achievement Interaction	Boys	1	.53	9.63	.08	.06	.20	.02
	Girls	1	.24	7.59	9.60	.06	.21	3.27
	Both	1	3.60	5.62	5.62	.57	.13	1.91
Within Groups	Boys	14	8.58	48.16	3.71			
	Girls	10	5.38	36.56	2.93			
	Both	32	6.35	44.60	2.94			
						Library Research	Critical Thinking	Expression
Total of Sums of Squares	Boys		348.79	1731.60	129.98			
	Girls		395.13	2955.98	118.18			
	Both		455.10	2041.94	125.02			

^aSignificant at the .05 level of confidence.

^bSignificant at the .01 level of confidence.

treatments. Group D significantly excelled in "Library Research" and the means of Group D followed a general pattern of superiority throughout all subclasses on this variable. No other significant overall inter-treatment differences appeared in the analyses, though several significant subclass differences and trends favoring D are indicated in Table VI.

Of interest, but perhaps not particularly surprising considering the nature of the tests, of the scores, and of the method of classification of the students, was the significant effect of achievement levels on performance on all three tests. As might be expected, students in the high achievement categories performed better than the low achievers regardless of treatment or intelligence level. The significant main effect of intelligence on the "Critical Thinking" scores again reflected the positive influence of that selector. The interaction of treatments and intelligence reflected the superiority of Group D at the high intelligence level and of Group F at the low level.

Iowa Tests of Basic Skills. The change score means of the experimental group and Control Group F on the ITBS may be seen in Table VIII on page 33; and the results of the several analyses of variance on this achievement test battery are given in Tables II A and II B on pages 34 and 35. Examination of these tables reveals that there was approximate between-treatments equality of boys, girls, and boys combined with girls in numbers of subclass superiorities while there were more Group D than Group F superiorities in main effects. No main effect findings however

TABLE VIII

MEANS OF CR SCORES FOR GROUPS D AND F
ON THE NA TESTS OF BASIC SKILLS

Area	Interval Between Testings	Sex	Mean of Grade-Equivalent Gains									
			Low-Low		Low-High		High-Low		High-High		Combined	
			Subclass	Group	Subclass	Group	Subclass	Group	Subclass	Group	Subclass	Group
			D	F	D	F	D	F	D	F	D	F
Vocabulary	16 mos.	Boys	2.02	1.30	3.12	2.75	1.52	2.65	3.55	2.10	2.56	2.28
		Girls	1.36	1.36	1.76	2.42	1.64	2.10	2.30	1.80	1.76	1.92
		Boys and Girls $\bar{x}$	—	—	—	—	—	—	—	—	—	—
Reading Comprehension	16 mos.	Boys	2.80 ^a	1.30	2.95	2.55	2.62	3.70	2.80	2.05	2.71	2.10
		Girls	2.04	1.48	2.56	2.30	2.26	2.66	2.80	2.98	2.42	2.36
		Boys and Girls .	2.00	1.68	2.72	2.46	2.88	3.20	3.18	2.68	2.70	2.50
Language Skills	16 mos.	Boys	1.22	1.35	2.68	2.55	2.15	1.30	1.63	1.75	1.93	1.74
		Girls	2.06	1.86	2.76	2.36	2.32	2.78	2.64	2.84	2.44	2.45
		Boys and Girls $\bar{x}$	—	—	—	—	—	—	—	—	—	—
Verb-Study Skills	16 mos.	Boys	1.75	1.70	3.05 ^a	1.70	2.60	3.05	2.46	3.00	2.47	2.36
		Girls	2.20	1.72	2.42	2.06	2.83	2.95	2.82	2.54	2.56	2.32
		Boys and Girls .	1.68	1.96	2.86 ^a	1.92	2.96	3.32	2.30	2.52	2.46	2.44
Arithmetic Skills	16 mos.	Boys	1.32	2.90 ^a	1.32	1.35	1.20	1.70	1.72	2.00	1.39	1.99 ^a
		Girls	.92 ^a	.27	1.80	1.28	1.37	1.78	1.26	1.90 ^a	1.32	1.28
		Boys and Girls $\bar{x}$	—	—	—	—	—	—	—	—	—	—

^aGreater than the corresponding school mean at the .05 level of significance.

The analysis of variance was made, and the separate findings on each sex had shown that the performances of subgroups to be combined were in opposite directions and would then be expected to produce a nonsignificant effect of treatment.

TABLE II A

ANALYSIS OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND F
ON THE IOWA TESTS OF BASIC SKILLS

Source of Variation	Sex	df	Mean Square					F				
			V	R	L	W	A	V	R	L	W	A
Treatments	Boys	1	1.19	52.08	20.02	6.02	188.02	.36	.84	.20	.07	3.43 ^a
	Girls	1	.02	3.60	.02	66.27	1.46	.27	.04	.00	.87	.02
Intelligence Levels	Boys	1	.04	60.17	16.67	170.67	0	.10	.97	.17	2.00	0
	Girls	1	.75	136.40	156.02	583.09	338.27	.62	3.92	1.60	7.67 ^b	5.75 ^a
Achievement Levels	Boys	1	.90	8.17	216.00	88.17	247.67	7.86 ^a	.13	2.21	1.03	.01
	Girls	1	.20	302.90	156.02	1.34	247.87	2.33	3.52 ^a	1.60	.02	4.22 ^a
Treatments x Intelligence Interaction	Boys	1	.52	120.33	20.02	188.02	22.69	.33	1.94	.20	2.20	.42
	Girls	1	.62	122.90	105.62	6.36	338.26	.34	1.43	1.08	.08	5.75 ^a
Treatments x Achievement Interaction	Boys	1	.12	2.08	15.19	90.02	105.02	1.05	.03	.16	.59	1.94
	Girls	1	.62	.40	13.72	5.10	8.50	.06	.00	.14	.07	.14
Intelligence x Achievement Interaction	Boys	1	.78	60.17	352.67	140.17	140.17	.00	.97	3.60 ^a	1.64	2.59
	Girls	1	.62	14.40	42.00	36.38	242.69	.85	.17	.43	.48	4.13 ^a
Treatments x Intelligence x Achievement Interaction	Boys	1	.22	385.83	44.02	63.02	58.52	1.95	6.21 ^a	.47	.74	1.08
	Girls	1	.16	16.90	.25	48.43	.61	1.85	.20	.00	.64	.01
Within Groups	Boys	16	11.27	62.09	77.92	85.45	94.17					
	Girls	8	80	85.89	77.71	76.05	58.79					
Total of Sum of Squares	Boys . . .			2247.70, V - 2253.31, W - 2013.29, A - 1361.81								
	Girls . . .			3403.74, V - 3599.87, W - 3484.77, A - 3294.00								

Boys: V-Vocabulary, R-Reading Comprehension, L-Language Skills, W-Work-Study Skills, A-Arithmetic Skills.
Significant at the .05 level. Significant at the .01 level.
df for V, R, and L is 32 and for W and A is 36.

TABLE IX B

ANALYSES OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND F
ON SELECTED PARTS OF THE IOWA TESTS OF BASIC SKILLS

Source of Variation	df	Mean Square		F	
		Reading Comprehension	Work-Study Skills	Reading Comprehension	Work-Study Skills
Treatments . .	1	36.10	.40	.39	.00
Intelligence Levels . . .	1	592.90	135.60	6.39 ^a	5.30 ^a
Achievement Levels . . .	1	102.40	6.40	1.10	.06
Treatments x Intelligence Interaction	1	10.00	96.10	.11	1.17
Treatments x Achievement Interaction	1	36.10	122.50	.39	1.49
Intelligence x Achievement Interaction	1	184.00	122.50	1.99	5.14 ^a
Treatments x Intelligence x Achievement Interaction	1	48.40	78.40	.52	.95
Within Groups	32	92.72	82.12		
Total of Sums of Squares . . .		3977.84		3789.40	

^aSignificant at the .05 level of confidence.

for between-treatments analyses were statistically significant and only four subclass differences were found to be significant—two favoring D and two favoring F. A further check for possible trends revealed the subclass findings indicated by asterisks in Table VIII at which points Group D was favored beyond the .10 level of significance but not at the .05 level.

It may be noted in Tables IX A and IX B that there were several significant *F* ratios which reflected the positive influence of each of the two selector variables on criterion performances regardless of treatment. Two significant two-way interactions and one significant three-way interaction are also indicated in the tables. The significant interaction of treatments and intelligence in the Arithmetic area for girls resulted largely from the superiority of Group F at the high intelligence level. The other significant two-way interaction, that of intelligence and achievement in the Work-Study Skills area, directs attention again to the ~~importance of the high intelligence-low achievement children on~~ this variable and to the possible influences of special help or special attention for children such as these.

Locally Adapted Tests. Results of calculations for these three tests are presented in Tables I and II on pages 37 and 38. Examination of the means in Table I reveals that nearly all subclass comparisons on "Library Research" and "Critical Thinking" favored the experimental group; and every over-all comparison favored that group though only one reached a statistically significant level. On the other hand, Control Group F earned means equal to or higher than Experimental Group D on "Expression"

TABLE I

MEANS OF SCORES FOR GROUPS D AND F ON THE LOCALLY TAUGHT SCHOLASTIC TESTS

Tests	Sex	Mean of Raw Scores											
		Low-High Subclass			High-Low Subclass			High-High Subclass			Combined Subclasses		
		Group D	Group F	Group D	Group F	Group D	Group F	Group D	Group F	Group D	Group D	Group F	Group F
Library Research	Boys	17.25	21.50	18.00	17.50	16.50	19.00	16.50	18.81	17.00			
	Girls	15.67	19.50	19.00	18.00	16.00	19.60	19.20	18.32	17.55			
	Boys and Girls .	16.00	22.80 ^b	18.00	18.80	17.20	19.10	17.20	19.25 ^a	17.30			
Critical Thinking	Boys	27.75	36.75	31.50	28.25	35.50	34.25	34.50	31.75	31.12			
	Girls	25.17	32.11	34.00	33.00 ^a	26.80	37.60	36.80	31.73	30.00			
	Boys and Girls .	27.80	34.80	29.60	32.20	30.80	31.80	35.00	30.85	29.90			
Expression	Boys	7.00	9.00	8.50	6.25	8.00	7.25	11.50	7.38	8.50			
	Girls	6.50	8.17	9.67 ^a	7.10	6.10	8.20	9.60 ^a	7.55	7.91			
	Boys and Girls .	6.60	8.10	8.60	7.60	7.60	8.00	10.20 ^b	7.65	8.10			

^a Greater than the corresponding mean α , the .05 level of significance.

^b Greater than the corresponding mean α , the .10 level of significance.

TABLE XI

ANALYSES OF VARIANCE OF SCORES FOR GROUPS D AND F
ON THE LOCALLY ADAPTED SCHOLASTIC TESTS

Source of Variation	Sex	df	Mean Square			F		
			Library Research	Critical Thinking	Expression	Library Research	Critical Thinking	Expression
Treatments . .	Boys	1	17.52	2.08	6.75	1.80	.04	1.90
	Girls	1	6.57	32.82	1.45	.63	.71	.71
	Both	1	36.10	9.02	2.02	4.31 ^a	.18	.94
Intelligence Levels . . .	Boys	1	7.04	22.04	0	.72	.18	0
	Girls	1	8.04	264.61	1.09	.77	5.69 ^a	.53
	Both	1	.90	172.22	9.02	.11	3.52 ^a	4.20 ^a
Achievement Levels . . .	Boys	1	26.04	234.38	24.00	2.68	5.06 ^a	6.77 ^a
	Girls	1	84.57	752.82	61.45	8.11 ^b	16.18 ^b	29.88 ^b
	Both	1	105.60	105.62	34.22	5.77 ^a	2.16	15.92 ^a
Treatments x Intelligence Interaction	Boys	1	.02	102.08	18.75	.00	2.21	5.29 ^a
	Girls	1	6.27	28.81	.25	.60	.62	.12
	Both	1	.10	34.22	4.22	.01	.70	1.97
Treatments x Achievement Interaction	Boys	1	7.52	18.75	3.00	.77	.40	.85
	Girls	1	1.11	56.82	13.09	.11	1.22	6.54 ^a
	Both	1	25.60	24.02	5.62	3.05 ^a	.49	2.62
Intelligence x Achievement Interaction	Boys	1	7.04	40.04	.17	.72	.66	.05
	Girls	1	5.47	8.67	1.21	.52	.19	.59
	Both	1	32.40	18.22	1.22	3.87 ^a	.37	.57
Treatments x Intelligence x Achievement Interaction	Boys	1	1.02	14.08	1.08	.10	.30	.31
	Girls	1	7.13	1.67	.11	.68	.04	.05
	Both	1	15.82	5.62	1.22	1.89	.12	.57
Within Groups	Boys	16	9.73	46.28	3.95			
	Girls	36	10.43	46.53	2.06			
	Both	32	8.38	48.89	2.15			
						Library Research	Critical Thinking	Expression
Total of Sums of Squares			Boys	221.88	1171.94	110.55		
			Girls	104.64	1821.30	152.81		
			Both	127.48	1933.42	126.34		

^aSignificant at the .05 level of confidence.

^bSignificant at the .01 level of confidence.

a majority of times. As was noted previously in the comparisons of Groups D and E, again achievement level was found to exert a significant effect upon performance on all three of these tests (see Table XI) as might be expected. The tests are of an academic nature, the students were categorized on the basis of academic achievement, and the criterion scores were raw scores. The significant two-way interaction reflected the superiority of the F group at the higher achievement level and the superiority of the D group at the lower level. This same trend for the experimental group to excel on these variables at the lower level can be noted to some extent in the analyses of Groups D and E.

II. SOCIAL AND EMOTIONAL SECURITY

The Institute of Child Study Security Test (16) afforded a measurement of two variables in the social-emotional area; viz., Security and Consistency. It was hypothesized that the experimental group might have gained in the areas measured as a consequence of their involvement in the summer session. In that session, classroom discussions on human relations were carried on regularly by the pupils. The intent in these was to increase personal effectiveness, which would seem to involve the factors of personal security and consistency to some degree. This test was administered both as a pre-test and as a post-test, and the change from the first to the second testing was the criterion score. A constant of 60 was added to each score in the analysis of variance computations to eliminate negative numbers.

Group D versus Group E. The means and the results of the variance analyses are shown in Tables XII and XIII (pages 40 and 41). It should

TABLE XII

MEANS OF CHANGE SCORES FOR GROUPS D, E, AND F ON THE
INSTITUTE OF CHILD STUDY SECURITY TEST

Variable Groups Compared		Mean									
		Low-Low Subclass		Low-High Subclass		High-Low Subclass		High-High Subclass		Combined Subclasses	
		Experimental Group	Control Group	Experimental Group	Control Group	Experimental Group	Control Group	Experimental Group	Control Group	Experimental Group	Control Group
Consistency D and E	Boys	-4.00	2.33	6.40	4.00	19.00	2.00	-4.80	23.00 ^a	4.15	7.83
	Girls	6.28	12.71	-	7.80	4.71	18.86	16.80 ^a	-8.20	6.25	9.12
	Boys and Girls .	-2.00	17.20 ^b	.80	12.00 ^b	5.20	14.60	15.20 ^b	7.20	4.80	12.75
Security D and E	Boys	-2.20	.33	5.00	2.00	8.20	-2.00	-2.40	9.33 ^a	2.15	2.42
	Girls	1.00	12.43 ^a	-.40	2.80	-2.14	6.43	4.60	-1.00	.54	5.88
	Boys and Girls .	-.60	6.60	1.20	4.40	-4.40	3.00	2.00	4.40	-.45	4.60
Consistency D and F	Boys	-7.00	20.50	13.50	9.00	11.75	-7.50	-6.50	20.50	2.94	10.62
	Girls	7.50	6.67	-2.20	4.60	4.33	21.00	16.80	14.40	6.55	11.86
	Boys and Girls .	-2.00	13.40	.80	2.20	5.20	9.40	15.20	21.20	4.80	11.55
Security D and F	Boys	-2.50	7.50	8.50	25.50	2.50	-3.50	-3.50	6.00	1.25	8.88 ^a
	Girls	2.50	10.33	-.40	1.40	-2.83	11.50	4.60	3.80	.86	7.14 ^a
	Boys and Girls .	-.60	13.40	1.20	8.60	-4.40	6.60	2.00	6.00	-.45	8.65 ^a

^aDifferent from the corresponding mean at the .05 level of significance.

^bDifferent from the corresponding mean at the .01 level of significance.

TABLE XIII

41

ANALYSES OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND E
ON THE INSTITUTE OF CHILD STUDY SECURITY TEST

Source of Variation	Sex	df	Mean Square		F	
			Consistency	Security	Consistency	Security
Treatments	Boys	1	101.75	.53	.32	.01
	Girls	1	99.19	341.33	.34	2.50
	Boys and Girls	1	632.02	255.02	1.90	2.83
Intelligence Levels . .	Boys	1	413.28	28.12	1.28	.35
	Girls	1	46.02	70.08	.16	.51
	Boys and Girls	1	126.02	27.22	.38	.30
Achievement Levels . .	Boys	1	.59	15.12	.00	.19
	Girls	1	586.93	100.06	1.99*	.74
	Boys and Girls	1	.02	34.22	.00	.38
Treatments x Intelligence Interaction . .	Boys	1	22.10	1.88	.07	.02
	Girls	1	305.02	85.33	1.03	.63
	Boys and Girls	1	525.62	.22	1.58	.00
Treatments x Achievement Interaction . .	Boys	1	609.19	126.08	1.88	1.57
	Girls	1	922.64	365.87	3.12*	2.68
	Boys and Girls	1	403.22	50.62	1.21	.56
Intelligence x Achievement Interaction . .	Boys	1	297.31	112.50	.92	1.40
	Girls	1	1.80	77.46	.01	.57
	Boys and Girls	1	15.62	42.02	.05	.47
Treatments x Intelligence x Achievement Interaction	Boys	1	1445.07	353.63	4.48 ^a	4.41 ^a
	Girls	1	1330.37	26.29	4.50 ^a	.19
	Boys and Girls	1	52.22	.62	.17	.01
Within Groups	Boys	24	318.69	80.17		
	Girls	40	295.51	136.34		
	Boys and Girls	32	332.72	90.21		
			Consistency		Security	
Total of Sums of Squares	Boys		10537.85		2561.94	
	Girls		15112.37		6520.02	
	Boys and Girls . . .		12404.78		3296.66	

^aSignificant at the .05 level of confidence.

be pointed out that the negative scores appearing in Table III were merely decreases from the scores of the previous year and in no way reflected below normal status on this test. At both testings boys in each treatment group scored above the mean of the norms population, and although the girls in one treatment did score slightly under the mean of the norms group, they were not significantly below.

For all groupings (boys, girls, and boys combined with girls), comparisons between means of corresponding subclasses and combined subclasses more frequently favored the control group than the experimental group. The significant triple interactions indicated in Table XIII point up again the trend toward the superiority of Group D boys at the High-Low subclass.

Group D versus Group F. The means of change scores for these two groups also are presented in Table XII. Again, as with the comparisons with Group E, those involving Group F more frequently favored that control group. None of the differences between the two groups, either over-all or in any subclass, reached the .05 level of statistical significance, however. The triple interaction on the Consistency variable which approached significance (see Table XIV on page 43) again directs attention to the Group D boys superiority in the High-Low subclass.

Within Groups	Boys	15	30.04	35.75
	Girls	24	28.92	33.63
	Boys and Girls	39	29.48	34.70
Total of Sums of Squares	Boys		5775.00	1675.91
	Girls		12611.96	3591.30
	Boys and Girls		18386.96	5267.21

TABLE XIV

ANALYSIS OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND F
ON THE INSTITUTE OF CHILD STUDY SECURITY TEST

Source of Variation	Sex		Mean Square		F	
			Consistency	Security	Consistency	Security
Treatments	Boys	1	315.19	310.08	.85	1.58
	Girls	1	311.11	432.82	1.05	3.40*
	Boys and Girls	1	455.62	828.10	1.11	3.48*
Intelligence Levels .	Boys	1	60.17	330.04	.16	1.68
	Girls	1	1011.84	3.27	3.44*	.03
	Boys and Girls	1	837.22	96.10	2.04	.40
Achievement Levels . .	Boys	1	73.50	234.38	.20	1.20
	Girls	1	23.73	99.82	.08	.77
	Boys and Girls	1	112.72	4.90	.27	.02
Treatments x Intelligence Interaction .	Boys	1	77.52	184.08	.21	.94
	Girls	1	148.29	15.34	.50	.12
	Boys and Girls	1	27.22	25.60	.07	.11
Treatments x Achievement Interaction . .	Boys	1	67.69	168.75	.18	.81
	Girls	1	89.13	305.47	.30	2.40
	Boys and Girls	1	93.02	115.60	.23	.46
Intelligence x Achievement Interaction	Boys	1	240.67	301.04	.65	1.54
	Girls	1	212.01	91.22	.72	.72
	Boys and Girls	1	570.02	48.40	1.39	.20
Treatments x Intelligence x Achievement Interaction	Boys	1	2041.02	24.08	5.51*	.12
	Girls	1	416.88	56.46	1.42	.44
	Boys and Girls	1	156.02	.10	.38	.00
Within Groups	Boys	16	368.64	195.22		
	Girls	36	294.50	127.43		
	Boys and Girls	32	410.14	237.78		
			Consistency		Security	
Total of Sums of Squares	Boys		8774.00		4675.97	
	Girls		12814.98		5591.90	
	Boys and Girls . . .		15375.82		8727.76	

III. NEEDS AND PROBLEMS

The SRA Junior Inventory-Form B (43) was administered in January of 1959 as a pre-test and was repeated in early May of 1960 for the purpose of assessing changes in student needs and problems. The criterion score was the difference between the pre- and the post-test and a constant of 60 was added for the analysis of variance computations. It should be pointed out that negative scores on this variable represented an expression of fewer problems and needs at the 1960 testing than at the 1959 testing and a positive score indicated a change involving more expressed problems. Thus a negative score may be interpreted to be the more favorable; this point will be elaborated upon later.

Group D versus Group E

Outcomes of the analyses for all five areas of the test are reported in Tables IV, IVI A, and IVI B (pages 45, 46, and 47). Table IV contains data showing that at the low level of intelligence the groupings of experimental subjects had barely a majority of instances when their subclass mean was the more favorable one of the two treatments. At the high level of intelligence the control pupils greatly exceeded the experimental pupils in numbers of favorable subclass means and, in this respect, were equally dominant with regard to the over-all effect of treatments. Despite a uniform trend of superiority for the combined subclasses of Group E over Group D on all five variables, only on the School variable were any of the differences between the treatments

TABLE IV

MEANS OF CHANGE SCORES FOR GROUPS D AND E
ON THE SRA JUNIOR INVENTORY-FORM 3

Means

Area	Sex	Low-Low Subclass				Low-High Subclass				High-Low Subclass				High-High Subclass				Combined Subclass			
		Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E
School	Boys	7.25	13.33	-16.52	- .33	1.00	-36.33 ^a	6.00	- 1.00	- .56	- 5.58										
	Girls	.11	- 1.43	4.00	-13.60 ^a	-3.71	- 9.86	.60	-23.60 ^b	- .17	-10.96 ^a										
	Boys and Girls	2.20	1.60	- 4.80	- 7.60	1.20	-28.20 ^b	3.60	- 7.70	- .60	-10.35 ^a										
Home	Boys	4.50	8.67	- 3.00	6.00	-2.75	- 8.67	2.25	3.67	.25	3.92										
	Girls	1.00	1.00	3.80	.40	.57	- .43	3.60	- 2.20	2.00	- .21										
	Boys and Girls	- .	- .	- .	- .	- .	- .	- .	- .	- .	- .										
Myself	Boys	5.50	13.67	- 2.75	13.67	2.25	-15.33	11.75	-13.67 ^b	6.39	- .62										
	Girls	.29	5.43	7.60	5.20	4.00	- 3.86	1.40	- 4.20	3.12	1.25										
	Boys and Girls	9.60	12.20	3.80	9.60	7.80	- 7.80 ^a	6.00	- 8.60	6.80	1.35										
People	Boys	11.00	9.33	- 2.25	3.00	-1.50	-12.32	12.50	- 9.67 ^a	6.96	- 2.62										
	Girls	4.00	3.00	8.20	7.40	3.00	- 2.57	4.20	- 2.80	4.62	1.00										
	Boys and Girls	6.40	6.20	3.20	5.00	4.80	- 9.80 ^a	6.40	- 7.00	5.20	- 1.60										
Things in General	Boys	4.75	15.00	- 2.50	- 4.00	1.75	- 7.00	4.75	- 4.67	2.39	- .17										
	Girls	- .43	4.29	3.60	- 3.40	4.57	- 2.14	.40	- 8.00	2.04	- 3.33										
	Boys and Girls	4.20	12.20	- .60	- 5.00	3.60	- 1.80	3.60	- 2.60	2.65	.70										

^aDifferent from the corresponding mean at the .05 level of significance.

^bDifferent from the corresponding mean at the .01 level of significance.

No analysis was made, since the separate findings on each sex had shown that the performance of subgroups to be combined were in opposite directions and would thus be expected to produce a nonsignificant effect of treatment.

TABLE IV: A

ANALYSIS OF VARIANCE OF CHANGE SCORES FOR GROUPS 9 AND 1
ON THE CHA JUNIOR INDEPENDENT-Form 5

Sources of Variation	Sex	df	Mean Square				F					
			School	Home	Myself	People	General	School	Home	Myself	People	General
Treatments	Boys	1	172.86	19.05	145.36	370.86	38.00	.61	.21	1.16	1.39	.36
	Girls	1	1397.52	58.52	12.19	150.52	136.69	6.13 ^a	1.06	.19	1.06	.56
Intelligence Levels . .	Boys	1	228.57	190.32	509.14	315.57	92.89	.80	2.12	1.37 ^a	1.18	.88
	Girls	1	175.02	15.19	221.02	285.19	72.52	2.00	.27	1.00	1.98	.29
Achievement Levels . .	Boys	1	9.14	6.04	3.57	2.28	160.32	.03	.07	.03	.03	1.53
	Girls	1	212.15	8.72	3.35	66.80	99.57	.93	.15	.02	.46	.60
Treatments x Intelligence Interaction . .	Boys	1	1787.58	165.76	1957.50	573.28	310.50	6.27 ^a	1.85	15.59 ^b	2.15	2.95
	Girls	1	93.52	7.52	180.19	82.69	196.02	.41	.13	.81	.57	.80
Treatments x Achievement Interaction . .	Boys	1	632.50	44.30	.08	8.36	66.08	2.22	.49	.00	.03	.63
	Girls	1	841.50	49.03	38.71	1.10	98.76	3.69 ^a	.87	.17	.03	.38
Intelligence x Achievement Interaction . .	Boys	1	2340.57	282.89	206.29	660.57	393.75	8.21 ^b	3.15 ^a	1.64	2.48	3.75 ^c
	Girls	1	1.43	.65	105.50	42.44	53.10	.03	.03	.48	.29	.23
Treatments x Intelligence x Achievement Interaction	Boys	1	142.74	.10	110.86	142.74	52.64	.50	.00	.88	.53	.50
	Girls	1	2.21	1.43	44.36	3.93	67.00	.03	.03	.20	.01	.19
Within Groups	Boys	20	285.19	89.72	125.60	266.86	105.10					
	Girls	40	227.96	56.49	221.65	144.38	216.18					
Total of Sums of Squares			Boys		Girls		General		Myself		People	
			11017.76		2502.86		5148.80		7110.76		3274.18	
			12141.75		2100.66		9703.32		6105.87		10514.86	

^aSignificant at the .05 level of confidence.^bSignificant at the .01 level of confidence.

TABLE IV: 3

ANALYSIS OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND E
ON SELECTED PARTS OF THE SEA JUNIOR INVENTORY-FORM E

Source of Variation	df	Mean Square				F			
		School	Myself	People	General	School	Myself	People	General
Treatments	1	950.62	297.02	435.60	38.02	3.81	1.36	2.60	.19
Intelligence Levels	1	198.02	893.02	435.60	12.02	.79	1.02	1.60	.81
Achievement Levels	1	81.22	75.62	0	319.22	.32	.36	0	1.56
Treatments x Intelligence Interaction	1	1050.62	931.22	947.60	110.62	4.21*	1.19*	3.02*	.69
Treatments x Achievement Interaction	1	93.02	11.02	6.60	112.22	.37	.05	.06	.95
Intelligence x Achievement Interaction	1	765.62	21.02	48.60	286.22	3.07*	.09	.27	1.60
Treatments x Intelligence x Achievement Interaction . .	1	403.22	3.02	.60	81.22	1.62	.03	.00	.60
Within Groups	32	2169.30	222.71	150.92	208.41				
Total of Sums of Squares						11519.96	9738.66	7263.66	7560.66

*Significant at the .05 level of confidence.

significant. In addition, there were several significant subclass differences and several trends (noted by asterisks), all of which also favored Group E (Table IV). The fact that the differences were most pronounced in the area of attitudes expressed about school may indicate that, after a somewhat different experience in the summer session, regular school was inadequate by comparison for the experimental subjects. In addition, the nature of the special session may have led them to admit to problems more freely.

It must be realized that though Group D children expressed more problems relating to the areas of the test than did Group E children, this must not be interpreted to indicate poor adjustment on the part of Group D. Children in both of these groups expressed fewer problems than the median of the norms group for their grade level; thus Group D children indicated a higher level of maturity than average children even though it did appear to be a diminishing differential.

It may be noted also from Table IV that on the whole and without regard to specific problem areas the girls of Group D rated somewhat more favorably in relation to their Group E counterparts than did the D boys to the E boys. In addition, the trend of Group D over all five areas was toward a larger proportion of decreases in the subclasses involving the low levels of both intelligence and achievement than in those at the high levels.

The significant F ratio for intelligence levels given in Table XVI A indicated that the more intelligent boys had more favorable change scores on *Myself* than the less intelligent. On this same variable, in General (see Tables XVII, XVIII A, and XVIII B, pages 50, 51, and 52).

two significant interactions were obtained when the boys and the boys combined with girls of one treatment failed to perform, from level to level of intelligence, in a manner similar to the other treatment (see Tables XVI A and XVI B). Specifically, the Group D subjects of high intelligence had somewhat poorer criterion scores than those of low intelligence while the Group F subjects of high intelligence had much better scores than those of low intelligence. The very same situation resulted on the School criterion variable, again with regard to the boys and to the boys combined with girls. Also, these findings have a similar trend as was noted earlier to the effect that Treatment D tended to have more frequent instances of decreased problems at the low level of intelligence than at the high level. The significant interaction of the two selectors on the School variable is explained by the fact that the combinations of high intelligence with low achievement and low intelligence high achievement seemed to be more favorable to adjustment than the low-low or the high-high levels.

Group D versus Group F

The change score means by subclasses and in the over-all for Groups D and F are shown in Table XVII on page 50. With one exception, the over-all inter-treatment differences were favorable to Group F. Group D boys were superior to F boys in numbers of problems in the School area. Despite the general Group F superiority only three of the inter-treatment differences were significant; viz., two main effect and one simple effect involving the variables of Home, Myself, and Things in General (see Tables XVII, XVIII A, and XVIII B, pages 50, 51, and 52).

TABLE XVII

MEANS OF CHANGE SCORES FOR GROUPS D AND F ON THE
SEA JUNIOR INVENTORY-FORM 5

Area	Sex	Mean											
		Low-Low			Low-High			High-Low			High-High		
		Group	Subclass	Group	Group	Subclass	Group	Group	Subclass	Group	Group	Subclass	Combined
		D	F	D	F	D	F	D	F	D	F	D	F
School	Boys	7.25	4.00	-15.00	0	1.00	4.50	1.00	4.50	.75	.50	-1.50	2.25
	Girls	0	-5.67	4.00	1.40	-7.33	-8.83	-7.33	-8.83	.60	-4.60	-.95	-5.15
	Boys and Girls	-.	-.	-.	-.	-.	-.	-.	-.	-.	-.	-.	-.
Home	Boys	4.50	-1.00	-2.00	-3.50	-2.75	-1.50	-.75	-1.50	-.75	2.50	-.25	-.80
	Girls	3.15	-.33	3.80	.80	-1.00	-4.17	3.60	-4.17	3.60	-2.20	2.27	-1.94
	Boys and Girls	2.80	-.60	1.60	-1.80	.20	-2.60	1.40	-2.60	1.40	.80	1.50	-1.05
Myself	Boys	5.50	-7.50	-3.50	-5.50	2.25	-1.00	2.25	-1.00	-1.75	5.00	.62	-2.25
	Girls	3.83	2.67	7.60	8.20	2.00	-3.50	2.00	-3.50	1.40	-11.40	3.66	-.95
	Boys and Girls	9.60	-3.60*	3.80	-.40	7.80	-2.40	6.00	-2.40	6.00	-3.40	6.80	-2.45*
People	Boys	11.00	-6.00*	-4.50	-5.00	-2.50	-2.50	1.00	-2.50	1.00	4.50	1.50	-2.25
	Girls	7.83	4.17	8.20	12.20	2.50	-1.17	4.20	-1.17	4.20	-8.60	5.66	1.99
	Boys and Girls	6.40	1.20	3.20	3.60	4.80	-1.60	6.40	-1.60	6.40	-.40	5.20	.70
Things in General	Boys	4.75	-8.50*	-2.50*	4.50	3.50	-8.50	4.00	-8.50	4.00	.50	2.44	-3.00*
	Girls	-1.50	-.67	3.60	2.20	3.83	-1.83	.40	-1.83	.40	-12.20	1.55	-2.95
	Boys and Girls	4.20	-8.20*	-.60	1.40	3.40	-3.60	3.60	-3.60	3.60	-4.20	2.65	-3.65*

*Different from the corresponding mean at the .05 level of significance.

#No analysis was made, since the separate findings on each sex had shown that the performances of sub-classes to be combined were in opposite directions and would then be expected to produce a nonsignificant effect of treatment.

TABLE XVIII

ANALYSES OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND F
ON THE SERA JUNIOR INVENTORY-FORM 5

Source of Variation	Sex	df	Mean Square				F				
			School	Name	Myself	People General	School	Name	Myself	People General	
Treatments	Boys	1	75.00	2.08	44.08	75.00	157.69	.34	.06	.38	1.17 ^a
	Girls	1	192.36	160.36	231.84	180.02	222.75	1.04	4.64 ^a	1.25	.99
											1.00
Intelligence Levels . .	Boys	1	66.67	7.04	32.67	.15	7.04	.30	.20	.28	.14
	Girls	1	236.47	93.09	712.02	811.84	90.20	1.27	2.69	1.84 ^a	4.65 ^a
											.16
Achievement Levels . .	Boys	1	468.17	9.38	54.00	54.00	12.04	2.11	.26	.46	.24
	Girls	1	307.40	47.35	.44	4.15	23.20	1.65	1.37	.00	.02
											.10
Treatments x Intelligence Interaction . .	Boys	1	24.08	44.08	114.08	133.35	28.52	.11	1.24	.97	1.15
	Girls	1	9.08	3.27	196.57	164.20	205.13	.05	.09	1.06	.90
											.57
Treatments x Achievement Interaction . .	Boys	1	70.08	12.00	147.00	147.00	275.52	.32	.33	1.25	1.26
	Girls	1	4.73	3.10	20.88	1.89	57.29	.03	.09	.11	.01
											5.54 ^a
Intelligence x Achievement Interaction . .	Boys	1	322.67	92.04	21.25	294.02	22.04	1.46	2.99	.18	2.53
	Girls	1	4.96	15.71	216.03	140.08	323.04	.03	.45	1.16	.77
											1.44
Treatments x Intelligence x Achievement Interaction	Boys	1	161.33	1.33	11.75	47.98	44.02	.73	.04	.10	.41
	Girls	1	18.21	6.70	56.05	197.05	15.06	.10	.19	.30	1.08
											.93
Within Groups	Boys	16	221.41	35.56	117.41	116.56	40.80				
	Girls	36	185.80	34.57	185.45	182.42	223.85				
Total of Sums of Squares			Boys		4730.56	736.91	2303.39	2616.46		1345.67	
			Girls		7462.01	1574.10	8110.03	8064.35		8995.25	

^aSignificant at the .05 level of confidence.

TABLE XVIII B

ANALYSES OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND F
ON SELECTED PARTS OF THE SRA JUNIOR INVENTORY-FORM 5

Source of Variation	df	Mean Square				F			
		Home	Myself	People	General	Home	Myself	People	General
Treatments	1	65.02	855.62	202.50	396.90	2.02	6.30 ^a	1.55	3.07 ^a
Intelligence Levels	1	3.02	1.22	16.90	3.60	.09	.01	.13	.03
Achievement Levels	1	3.02	18.22	2.50	12.10	.09	.13	.02	.09
Treatments x Intelligence Interaction	1	7.22	3.02	14.10	12.10	.22	.02	.34	.09
Treatments x Achievement Interaction	1	3.02	60.02	16.90	115.60	.09	.44	.13	.90
Intelligence x Achievement Interaction	1	30.62	.02	8.10	16.90	.95	.00	.06	.13
Treatments x Intelligence x Achievement Interaction	1	3.02	12.02	22.50	114.40	.09	.31	.17	1.12
Within Groups	32	32.19	135.80	130.39	129.14				
Total of Sums of Squares						1145.02	5225.74	4485.98	4634.08

^aSignificant at the .05 level of confidence.

Aside from inter-treatment comparisons, the experimental group again had a larger proportion of decreases at the high than at the low levels of both intelligence and achievement.

The significant F ratio for intelligence levels (Table XVIII A) was the result of the better performance on the People variable by girls at the high intelligence level than by those at the low level. A significant F ratio for the interaction between treatments and achievement for boys on the Things in General variable was the result of Group D's better performance at the high achievement level and Group F's better performance at the low level.

IV. INTERESTS

The What I Like To Do (46) inventory was the instrument employed to assess changes in interests over the period of the study. Three areas of the inventory, Social Studies, Quiet Play, and Science, were judged to be most relevant to the present investigation and were selected for analysis. All change scores were increased by 60 for the analysis variance in order to eliminate negative numbers from those computations.

Group D versus Group E

Data for Groups D and E relative to change on the What I Like To Do inventory are presented in Tables XIX and XX on pages 54 and 55. Examination of these tables reveals that in general Group D expressed more interests at post-test time in the areas analyzed than they had one year earlier while Group E expressed fewer interests. The differences favoring the girls of Group D were statistically significant for all

TABLE XIX

MEANS OF CHANGE SCORES FOR GROUPS D AND E ON SELECTED PARTS OF THE WHAT I LIKE TO DO INVENTORY

Area	Sex	Mean									
		Low-Low Subclass		Low-High Subclass		High-Low Subclass		High-High Subclass		Combined Subclasses	
		Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E	Group D	Group E
Social Studies	Boys	-12.00	-4.33	-.40	-8.00	7.60	-.33	-5.80	.33	-2.65	-3.08
	Girls	2.33	-6.33	6.60	4.40	-.33	-5.33	12.00 ^b	-7.80	4.77 ^b	-3.96
	Boys and Girls	-3.40 ^a	-10.40	1.00	2.00	6.20	.20	9.00	-3.80	3.20	-3.00
Quiet Play	Boys	-5.00	-2.00	-.60	-4.00	4.40	.67	-2.60	.67	-.95	-1.17
	Girls	.17 ^a	-8.83	.80	-2.00	4.00	-1.00	2.20	-2.60	1.82 ^a	-3.73
	Boys and Girls	1.60 ^a	-6.60	-.60	-4.40	6.60	1.20	2.40	0	2.50 ^a	-2.45
Science	Boys	-18.60	-13.67	-.40	-13.33	20.40 ^a	-2.00	4.20	-3.33	1.40 ^a	-8.08
	Girls	-8.17	-19.00	0	-5.60	..83	-6.33	12.00 ^a	-9.00	.27 ^a	-10.23
	Boys and Girls	-14.00	-27.80	-3.20	-3.40	13.60	5.00	12.40	-3.40	2.20	-7.40

^aDifferent from the corresponding mean at the .05 level of significance.

^bDifferent from the corresponding mean at the .01 level of significance.

TABLE XX

ANALYSES OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND E
ON SELECTED PARTS OF THE WHAT I LIKE TO DO INVENTORY

Source of Variation	Sex	df	Mean Square			F		
			Social Studies	Quiet Play	Science	Social Studies	Quiet Play	Science
Treatments . . .	Boys	1	1.41	.35	674.50	.01	.01	3.31*
	Girls	1	837.82	338.27	1212.75	9.35 ^b	6.35 ^a	4.45 ^a
	Both	1	384.40	245.02	921.60	2.41	4.03 ^a	2.26
Intelligence Levels . . .	Boys	1	364.50	108.78	2502.78	2.39	3.64*	12.28 ^b
	Girls	1	44.00	124.45	603.84	.49	2.34	2.22
	Both	1	313.60	255.02	3610.00	1.96	4.19 ^a	8.86 ^b
Achievement Levels . . .	Boys	1	10.12	11.28	1.53	.07	.38	.01
	Girls	1	421.60	11.28	686.59	4.71 ^a	.21	2.52
	Both	1	152.10	18.22	409.60	.95	.30	1.00
Treatments x Intelligence Interaction	Boys	1	1.63	.00	225.50	.11	.00	1.11
	Girls	1	99.00	4.46	46.02	1.11	.08	.17
	Both	1	102.40	11.02	67.60	.64	.18	.17
Treatments x Achievement Interaction	Boys	1	.68	.17	4.22	.00	.01	.02
	Girls	1	47.35	27.93	71.87	.53	.52	.26
	Both	1	.90	34.22	25.60	.01	.56	.06
Intelligence x Achievement Interaction	Boys	1	392.00	81.28	979.03	2.57	2.72	4.81 ^a
	Girls	1	17.97	80.51	88.61	.20	1.51	.33
	Both	1	212.50	18.22	1254.40	1.27	.30	3.08*
Treatments x Intelligence x Achievement Interaction	Boys	1	403.33	84.17	5366.83	2.64	2.82	26.34 ^b
	Girls	1	308.37	24.54	293.10	3.44*	.46	1.08
	Both	1	136.90	1.22	270.40	.86	.02	.66
Within Groups	Boys	24	152.63	29.87	203.74			
	Girls	36	89.57	53.29	272.39			
	Both	32	159.71	60.81	407.64			
			Social Studies			Quiet Play	Science	
Total of Sums of Squares			Boys	4836.79		1002.91	14644.15	
			Girls	5000.64		2529.88	12808.98	
			Both	6403.52		2528.86	19603.68	

*Significant at the .05 level of confidence.

^bSignificant at the .01 level of confidence.

three areas, though D boys and girls combined also scored significantly higher than E boys and girls on interests in the Quiet Play area. Other significant main effects indicated in Table XX reflected the positive influence of each of the two selector variables on criterion performance regardless of treatment. In connection with the significance of the interaction of intelligence and achievement and of the triple interaction for the boys in Science the increase in interests at the High-Low subclass in contrast to general decreases at other levels should be noted. The same trend for this subclass to obtain higher change score means can be observed to some extent throughout Table XIX though there were no other significant interactions.

Group D versus Group F

Results of the administration of the inventory to Groups D and F are presented in Tables XXI and XXII (pages 57 and 58). Though comparisons of means continued to favor Group D generally, both at the subclass levels and in the over-all, none of the differences between the over-all treatments attained statistical significance. The general trend previously noted for the means of the High-Low subclass to exceed the means of the other subclasses in both treatments and for this to be more pronounced for the experimental group can again be observed. The significant main effects indicated in Table XXII reflected again the positive influence of one of the selectors (intelligence) on the criterion. The only other significant interaction, that of treatments x achievement, directs attention to the differences in Social Studies between the two groups of girls at the high achievement levels and

TABLE XXI

MEANS OF CHANGE SCORES FOR GROUPS D AND F ON SELECTED PARTS OF THE WHAT I LIKE TO DO INVENTORY

Area	Sex	Mean											
		Low-Low Subclass			Low-High Subclass			High-Low Subclass			High-High Subclass		
		Group D	Group F	Group D	Group F	Group D	Group F	Group D	Group F	Group D	Group F	Group D	Group F
Social Studies	Boys	- 6.75	5.00	- 1.25	1.00	14.25 ^a	- 6.00	1.75	9.00	2.00	2.25		
	Girls	2.33	- 3.00	6.60	- 2.60	- .33	8.50	12.00 ^a	- 2.60	4.77	.32		
	Boys and Girls	- .	- .	- .	- .	- .	- .	- .	- .	- .	- .		
Quiet Play	Boys	- 5.25	- 1.50	- .50	- 3.00	6.25	.50	0	4.50	.12	.12		
	Girls	.17	- 2.83	.80	1.60	6.00	1.00	2.20	- 1.00	1.82	.36		
	Boys and Girls	1.60	- 5.00	- .60	- 1.60	6.60	2.60	2.40	.40	2.50	.90		
Science	Boys	- 21.50	- 6.50	- 2.75	- 2.00	29.00 ^a	- 16.50	13.00	2.50	4.44	- 5.62		
	Girls	- 8.17	- 6.00	0	3.40	- .83	3.67	12.00	- 3.20	.27	.59		
	Boys and Girls	- 14.00	- 14.00	- 3.20	2.80	13.60	6.00	12.40	- 2.40	2.20	- 1.90		

^aDifferent from the corresponding subclass mean at the .05 level of significance.

#No analysis was made, since the separate findings on each sex had shown that the performances of subclasses to be combined were in opposite directions and would then be expected to produce a nonsignificant effect of treatment.

TABLE XXII

ANALYSES OF VARIANCE OF CHANGE SCORES FOR GROUPS D AND F
ON SELECTED PARTS OF THE WHAT I LIKE TO DO INVENTORY

Source of Variation	Sex	df	Mean Square			F		
			Social Studies	Quiet Play	Science	Social Studies	Quiet Play	Science
Treatments . .	Boys	1	.33	0	540.02	.00	0	1.30
	Girls	1	218.27	52.36	8.20	2.21	1.11	.02
	Both	1	#	115.60	168.10	#	2.43	.29
Intelligence Levels . . .	Boys	1	337.50	187.04	2688.17	2.06	8.96 ^a	6.45 ^a
	Girls	1	145.46	36.36	378.20	1.47	.77	1.10
	Both	1	- -	193.60	2102.50	- -	4.07*	3.57*
Achievement Levels . . .	Boys	1	1.50	.04	140.17	.01	.00	.34
	Girls	1	23.74	1.09	377.60	.24	.02	1.10
	Both	1	- -	16.90	202.50	- -	.36	.34
Treatments x Intelligence Interaction	Boys	1	243.00	2.08	1716.02	1.48	.10	4.12*
	Girls	1	76.45	9.09	141.84	.77	.19	.41
	Both	1	- -	1.60	504.10	- -	.03	.86
Treatments x Achievement Interaction	Boys	1	108.00	5.33	143.52	.66	.26	.34
	Girls	1	508.15	8.84	232.51	5.14 ^a	.19	.68
	Both	1	- -	36.10	.90	- -	.76	.00
Intelligence x Achievement Interaction	Boys	1	48.17	45.37	504.17	.29	2.17	1.21
	Girls	1	8.04	53.60	91.75	.08	1.13	.27
	Both	1	- -	36.10	864.90	- -	.76	1.47
Treatments x Intelligence x Achievement Interaction	Boys	1	456.33	90.75	808.52	2.78	4.35	1.94
	Girls	1	261.04	10.91	298.78	2.64	.23	.87
	Both	1	- -	8.10	108.90	- -	.17	.19
Within Groups	Boys	16	163.31	20.88	418.33			
	Girls	36	98.88	47.29	344.25			
	Both	32	- -	47.51	590.22			
			Social Studies Quiet Play Science					
Total of Sums of Squares	Boys			3807.79	664.69	13233.87		
	Girls			4800.83	1874.69	13921.88		
	Both			- -	1928.32	22838.94		

^aSignificant at the .05 level of confidence.

#No analysis was made, since the separate findings on each sex had shown that performances of subgroups to be combined were in opposite directions and would then be expected to produce a nonsignificant effect of treatment.

particularly in the High-High subclass. Reference to Table XXI indicates the difference at this subclass level favored D significantly.

V. REPUTATION

In February 1960 all subjects in Treatment Groups D and F were rated on their reputations in their respective classrooms by means of a "Sociometric-Choice" rating scale constructed by investigators in this study. In form, this scale consisted of a collection of fifteen brief statements describing certain typical intellectual and personal-social behaviors of intellectually gifted children. The test response required of the student was that he make a first, a second, and a third choice, in turn, of his classmates described by the behavioral statements. It was found best to pool the total of ratings on all fifteen items to obtain a single score for an individual, since the correlation between the intellectual and personal-social part scores indicated that they were measuring the same thing to a large extent. The number of times an individual was chosen by all his classmates was his raw score. The most feasible procedure seemed to be to convert the raw score to the percentile rank within the classroom group; such percentile ranks were the criterion scores used in the analyses.

The size and membership of classrooms in which the subjects of the present investigation were pupils at the time of testing were studied. Findings showed little possibility of bias arising from differences in classroom constituencies between the two treatment groups. The median number of pupils in classrooms of which D boys, F boys,

D girls, and F girls were members was 33 in each case. Furthermore, members of both treatment groups were dispersed in classrooms in a sizable number of schools.

Table XXIII below contains criterion score means for subclasses and treatment samples. Three out of four comparisons between subclass means for boys showed a higher average reputation for the subgroupings of control subjects than for experimental subjects. Also, control boys surpassed experimental boys over the whole range of subgroupings combined at just short of the .05 level of significance. Comparisons between the girls resulted in exactly the reverse findings as to treatment group superiority in each subclass and over the entire range of

TABLE XXIII

MEANS OF PERCENTILE RANKS FOR GROUPS D AND F
ON A SOCIOMETRIC-CHOICE RATING SCALE

Sex	Mean									
	Low-Low Subclass		Low-High Subclass		High-Low Subclass		High-High Subclass		Combined Subclasses	
	Group D	Group F	Group D	Group F	Group D	Group F	Group D	Group F	Group D	Group F
Boys . . .	42.00	75.00 ^a	84.25	92.50	41.50	71.00 ^a	84.75	82.00	63.12	80.12 ^a
Girls . . .	75.83	66.17	87.50	78.17	76.60 ^a	52.80	73.00	76.20	78.55	68.68

^aDifferent from the corresponding mean at the .05 level of confidence.

subgroupings combined. From the analysis of variance results given in Table XXIV below it may be seen that all boys at the higher level of achievement had a significantly superior mean to those at the lower level. The computations did not reveal any other significant main effects or interactions.

TABLE XXIV

THREE-DIMENSIONAL ANALYSES OF VARIANCE OF PERCENTILE RANKS FOR GROUPS D AND F ON THE SOCIOMETRIC-CHOICE RATING SCALE

Source of Variation	Sex	df	Mean Square	F
Treatments	Boys	1	1541.33	3.66*
	Girls	1	1070.20	2.58
Intelligence Levels	Boys	1	35.04	.08
	Girls	1	576.05	1.39
Achievement Levels	Boys	1	6633.38	15.73 ^a
	Girls	1	1320.02	3.19*
Treatments x Intelligence Interaction	Boys	1	70.08	.17
	Girls	1	1.74	.00
Treatments x Achievement Interaction	Boys	1	1083.00	2.57
	Girls	1	426.57	1.03
Intelligence x Achievement Interaction	Boys	1	3.38	.01
	Girls	1	10.19	.02
Treatments x Intelligence x Achievement Interaction	Boys	1	18.75	.04
	Girls	11	484.85	1.17
Within Groups	Boys	16	421.69	
	Girls	36	414.19	
Total of Sums of Squares	Boys			16132.00
	Girls			18800.46

^aSignificant at the .05 level of confidence.

CHAPTER V

SUMMARY AND IMPLICATIONS

I. SUMMARY

The purpose of this investigation was to devise a special summer curriculum for a group of rapid learning children and then to study the effects of that curriculum on certain facets of the achievement and adjustment of those children approximately one school year later. The investigation was designed in such a way that the children who participated in the experimental program could be compared with the children in two control groups.

The instruments used to measure achievement were in the nature of skills tests. They were the Iowa Tests of Basic Skills and three locally adapted tests entitled "Library Research," "Critical Thinking," and "Expression." Instruments employed to give indications of adjustment and security were the SRA Junior Inventory-Form S and the Institute of Child Study Security Test. The What I Like To Do inventory was administered in order to study the children's interests, and a locally prepared sociometric-choice rating instrument was used to obtain a measure of reputation in the eyes of the peer group.

It was hypothesized for the purposes of this study that the Experimental Group would not differ significantly as a whole or in any intelligence-achievement classification from either control group with reference to the following:

1. Gains in achievement on the Iowa Tests of Basic Skills

2. Performance on three locally adapted skills tests of library research, critical thinking, and written expression
3. Changes in social-emotional security as measured by the Institute of Child Study Security Test
4. Changes in adjustment as measured by the SRA Junior Inventory-Form S
5. Changes in interests as measured by the What I Like to Do inventory
6. Reputation in the peer group as measured by a locally prepared rating instrument

Teacher-pupil planning was emphasized in the special program and the curriculum was planned around the children's interests. Each child was given the opportunity to do individual research on a chosen topic, and skills pertaining to the use of the library and the preparation of an individual research paper were taught as the needs arose. Problems of human relations, activities to develop redefinition abilities and ideational fluency, and practice in setting up goals and then evaluating progress toward those goals were included in the program.

Briefly, the findings were as follows:

1. It should be noted in the beginning that all groups made over-all gains on the Iowa Tests of Basic Skills generally in keeping with their previous rate of progress. Though the differences between the experimental group and each of the control groups did generally favor the experimental group, they reached significant levels for combined subclasses only in some of the comparisons with Control Group E. A number of significant subclass differences also favored the experimental pupils, however, for the superiority of E boys to be more noticeable predominately at the higher levels of intelligence in the

comparisons with Group E and at the lower levels of intelligence in the comparisons with Group F.

2. The null hypothesis cannot be accepted throughout with reference to all the locally adapted measures of achievement. Group D as a whole significantly exceeded both Group E and Group F on library research. The low intelligence-high achievement subclass of Group D also exceeded the comparable subclasses of Groups E and F on this test. There were no significant over-all treatment differences on the tests of written expression or critical thinking, though there were three subclass differences significant at the .05 level which favored the low intelligence-high achievement and high intelligence-low achievement subclasses of D over E in critical thinking. In the High-High subclasses there seemed to be a tendency for the controls to exceed the experimentals on both of these tests, though the superiority reached statistical significance only in one comparison (Group D versus Group F boys combined with girls on the test of expression).
3. The hypothesis of no significant differences in change with respect to social-emotional security can be accepted with a few minor exceptions. Though the control groups tended to gain more than the experimental group, there were no significant differences between over-all treatments. There were some scattered significant differences between subclasses but they presented no pattern of superiorities. Again a tendency could be observed, however, for the superiorities of D boys to be more noticeable

at the Low-High and High-Low subclasses, particularly on the consistency variable.

4. The null hypothesis with respect to changes in numbers of problems expressed on the SRA Junior Inventory-Form 3 must be rejected in several instances. Though significant differences were few, those found between over-all treatments and at subclass levels favored the controls over the experimentals. Again Group D superiorities were more frequently in the Low-High and High-Low subclasses.
5. The null hypothesis relative to differences in changes in expressed interests in certain areas must be rejected in comparisons involving one control group and accepted in comparisons involving the other control group. Group D generally expressed more interests than either of the controls and significantly more than Group E in the comparisons of the girls on all three areas. The tendency was observed again for the High-Low subclasses of D to be superior to the comparable controls and also to be superior in intra-treatment comparisons.
6. In comparisons of reputation between Groups D and F on the whole the null hypothesis must be retained though it can be rejected with regard to the findings on each sex separately in some subclasses. The boys of Group F were superior to the boys of Group D in all but the High-High subclass comparison and significantly so in the Low-Low subclass. On the other hand, the girls of Group D exceeded the girls of Group F in all but one instance

(the High-High level) and significantly so in the High-Low subclass.

In over-all treatment comparisons or when considering the total number of subclass comparisons the experimentals exceeded the controls (at significance levels beyond .10) more often than the controls exceeded the experimentals. However, the experimental subjects achieved most of their superiorities in the academic skills and related interests; the control subjects were favored more often than the experimentals in the other types of comparisons combined (security, adjustment, etc.). The reader should be reminded that though the control pupils were superior in gains on the instruments purporting to measure security and adjustment, the experimental subjects as well as the control subjects were performing generally at or above the means for their grade level on these instruments and should not be judged as a group relatively poorly adjusted.

All in all, there seemed to be a discernible tendency pervading the analyses for the superiorities of the experimental pupils over the control pupils to occur more frequently at the high level of intelligence regardless of level of achievement. However, when both selector variables were considered together, it was found that the experimental children who were in the high intelligence-low achievement category and the ones in the low intelligence-high achievement category were superior (at significance levels beyond .10) in comparisons in the academic areas twice as often as were the children in the other two categories. In the first instance, those children had the potential and were perhaps

given the lift to morale and the assistance with skills to stimulate them to the higher achievement of which they were capable. The children in the low intelligence-high achievement classification were the ones who could be described as persistent and they put to good use the skills gained in the special session. The picture certainly is not clear-cut, but it would seem that children at the lower intelligence level (relatively speaking) who were also the poorer achievers profited least from the type of special session conducted in the summer of 1959. Perhaps another type of curriculum needs to be considered for that particular type of child.

Another over-all observation was the fact that the experimental group was favored more often in its comparisons with Group E than it was in its comparisons with Group F. The explanation of this may lie in the physical location of the groups. Group E was selected in a community some 100 miles distant and those subjects were not eligible for the special session and had no contacts with anyone involved in it. Neither was any status or motivation involved in being selected as subjects. On the other hand, subjects in Control Group F and the experimentals often were neighbors and playmates and/or students in the same schools and classrooms. Thus some contamination may have occurred as the children shared experiences. Also, students in Control Group F gained a certain amount of status and prestige among their classmates and in the community by being declared eligible for the special session; this may have been added motivation.

II. IMPLICATIONS OF THIS INVESTIGATION

The present investigation continues to point up the desirability of further study of special summer programs or other arrangements for rapid learning children. There were some definite superiorities in academic areas demonstrated by the experimental group, particularly at certain intelligence-achievement combinations. This might imply, then, that the schools are not doing in the regular term all that can be done to aid these children to achieve in keeping with their potential and that a special term might have real value. On the other hand the superiorities of the experimental group were neither frequent enough nor great enough to warrant the unqualified recommendation as yet of a summer program of this type for academic purposes.

The fact that the classifications of generally capable pupils which seemed to benefit most from the special session were the two groups of children who were characterized by the possession of one selector trait to a high degree and the other trait to a low degree certainly makes difficult any conclusive interpretation of the data and indicates that neither factor alone would have served as the selector as well as the combination of selectors for choosing the children to participate in this special program. More study perhaps would be profitable in which one selector variable would be held at a somewhat constant level and the subjects categorized on the basis of three, four, or more levels of the other. This could be done involving several and varied levels of each selector. A modification somewhat similar is being tried in a further phase of this study.

The present investigation involved relatively small numbers of boys which had been selected at certain intelligence-achievement levels, and the establishment of significant differences was then made more difficult. With larger numbers of cases many of the differences which were between the .10 and the .05 levels of significance and interpreted as trends worthy of further investigation might prove to be real differences. Another portion of this study now in progress has been designed to provide more cases for analysis.

The investigators feel that the results of this portion of the study have been influenced by the handling of Control Group F. Students in this control group and their parents were apprised prior to the special session of the fact that they qualified for inclusion in the study but were not selected to attend the summer term. They achieved a considerable degree of status and recognition from this alone, perhaps enough to provide the stimulation for some of their gains. This situation has been considered and is being studied in the continuation of this investigation. Control subjects have been selected who are not aware of their inclusion in the project and who will be compared both with subjects in an experimental session and with subjects who have been notified of their status.

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TABLE XIV

DISTRIBUTION OF SUBJECTS BY SUBCLASSES
OF CRIMINAL GROUPS C, E, AND F

Subclasses		Boys			Girls			Boys and Girls		
Description	Range of Scores	Superior	Control	Subnormal	Superior	Control	Subnormal	Superior	Control	Subnormal
		Group A	Group B	Group C	Group D	Group E	Group F	Group G	Group H	Group I
High-High	IQ - 120 and above CE - 7.0 and above	9	0	9	6	7	4	15	11	13
High-Low	IQ - 120 and above CE - 6.9 and below	5	6	5	7	6	7	15	10	12
Low-High	IQ - 120 to 125 CE - 7.0 and above	9	3	2	10	5	23	15	8	25
Low-Low	IQ - 120 to 125 CE - 6.9 and below	5	6	9	10	4	8	15	13	12

APPENDIX

*The first word describes the relative position in the unselected distribution of scores on the Heaven-Neale Test of Mental Ability. The second word describes the position on the group-aptitude scale of the low Test of Basic Skills.

TABLE XXV
DISTRIBUTIONS OF SUBJECTS BY SUBCLASSES
IN ORIGINAL GROUPS D, E, AND F

Subclasses		Boys			Girls			Boys and Girls		
Description ^a	Range of Scores	Experimental	Control	Control	Experimental	Control	Control	Experimental	Control	Control
		Group D	Group E	Group F	Group D	Group E	Group F	Group D	Group E	Group F
High-High	IQ - 126 and above GE - 7.0 and above	9	4	9	6	7	6	15	11	15
High-Low	IQ - 126 and above GE - 6.9 and below	8	6	8	7	8	7	15	14	15
Low-High	IQ - 120 to 125 GE - 7.0 and above	5	3	2	10	5	13	15	8	15
Low-Low	IQ - 120 to 125 GE - 6.9 and below	5	6	9	10	9	6	15	15	15

^aThe first word describes the relative position in the truncated distribution of scores on the Henmon-Nelson Tests of Mental Ability. The second word describes the position on the grade-equivalent scale of the Iowa Tests of Basic Skills.

TABLE XXVI

DISTRIBUTIONS OF SUBJECTS FROM GROUPS D AND E
FOR THE ANALYSES OF VARIANCE

Test	Sex	Treatment	Number			
			Low-Low Subclass	Low-High Subclass	High-Low Subclass	High-High Subclass
<u>Critical Thinking, Expression, Institute of Child Study Security Test, Iowa</u> <u>Tests of Basic Skills, Library Research,</u> <u>and What I Like to Do</u>	Boys	D	5	5	5	5
		E	3	3	3	3
<u>SSA Junior Inventory-Form 5</u>	Boys	D	4 ^a	4 ^a	4 ^a	4 ^a
		E	3	3	3	3
<u>Critical Thinking, Expression, Institute of Child Study Security Test, Iowa</u> <u>Tests of Basic Skills, Library Research,</u> <u>and SSA Junior Inventory-Form 5</u>	Girls	D	7	5	7	5
		E	7	5	7	5
<u>What I Like to Do</u>	Girls	D	6 ^a	5	6 ^a	5
		E	6 ^a	5	6 ^a	5
All tests ^b (see listings above)	Boys and Girls	D ^c	5	5	5	5
		E ^c	5	5	5	5

^aReduced in numbers as compared to the other variables due to the lack of one post-test score.^bWith the exceptions of those noted elsewhere in this report as having been excluded from any such analysis due to the trend of the analyses by sexes.^cIn the proportions of two boys and three girls in each subclass.

TABLE XVIII
DISTRIBUTIONS OF SUBJECTS FROM GROUPS D AND F
FOR THE ANALYSES OF VARIANCE

Test	Sex	Treatment	Number			
			Low-Low Subclass	Low-High Subclass	High-Low Subclass	High-High Subclass
<u>Critical Thinking, Expression, Institute of Child Study Security Test, Iowa Tests of Basic Skills, Library Research, SRA Junior Inventory-Form 5, Sociometric-Choice Tests, and What I Like to Do</u>	Boys	D	4	4	4	4
		F	2	2	2	2
<u>Institute of Child Study Security Test, Work-Study Skills and Arithmetic Skills, areas of the Iowa Tests of Basic Skills SRA Junior Inventory-Form 5, and What I Like to Do</u>	Girls	D	6	5	6	5
		F	6	5	6	5
<u>Vocabulary, Reading Comprehension, and Language Skills areas of the Iowa Tests of Basic Skills</u>	Girls	D	5	5	5	5
		F	5	5	5	5
<u>Critical Thinking, Expression, Library Research, and Sociometric-Choice Test</u>	Girls	D	6	6	5	5
		F	6	6	5	5
All tests ^a (see listings above)	Boys and Girls	D ^b	5	5	5	5
		F ^b	5	5	5	5

^aWith the exceptions of those noted elsewhere in this report as having been excluded from any such analysis due to the trend of the analyses by sexes.

^bIn the proportions of two boys and three girls in each subclass